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THE ELEMENTS

OF THE

PSYCHOLOGY OF COGNITION

BY THE

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Second Edition

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PREFACE TO FIRST EDITION.

THE present work professes to be an introduction to a very interesting and important subject of study,—the psychology of the intellectual part of the human mind. It is designed principally for the use of students who are beginning their philosophical studies, and the writer has therefore endeavoured to express himself in as clear and simple language as possible. But while intended primarily for this class of readers, it is hoped that those who have already made the acquaintance of the subject will find something to interest them.

The writer is ready to admit that one principal object which he kept before his mind in the preparation of the book was to show the inadequacy and unsatisfactoriness of a prevailing system of psychology which may be indicated by the word "phenomenalism." At the same time he admits also having received much assistance at various times in matters of psychological analysis from writers who have supported that system. For valuable suggestions regarding the process of reasoning, particular acknowledgments are due to Mr. Herbert Spencer, who, in his "Principles of Psychology," has given an admirable exposition of the nature of the reasoning process.

The author has no intention to deprecate criticism of any of the doctrines which he has attempted to establish. The only consideration which he wishes to urge upon the critic is that the book has been written with considerable haste, in order to secure its publication within a certain limited time. And, therefore, there are probably many details which would be altered if a somewhat longer time had been allowed before giving the work a final revision previous to publication.

PREFACE TO SECOND EDITION.

THE author of this little manual of psychology ventures to offer a Second Edition, revised and considerably improved. He hopes that the favourable reception accorded to the First Edition will be extended likewise to the Second, and that it may be still more useful as an introduction to a very interesting and important subject of study.

Attention is called to the vocabulary of philosophical terms at the close of the volume, which will be a valuable help to the uninitiated reader in becoming acquainted with the somewhat uncommon phraseology of philosophy.

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THE ELEMENTS

OF THE

PSYCHOLOGY OF COGNITION.

CHAPTER I.

INTRODUCTION.

SECTION I.

SOURCES AND ARRANGEMENT.

CHAP. I. SECT. I.

Classification and character of cognition.

§ 1. THE Psychology of Cognition forms an important part of the philosophy of the human mind, cognition being one of the three great classes of phenomena which, according to the generally accepted division, constitute the mind. The remaining two classes may be designated the Feelings and the Voluntary Activities. These, however, will not come under our special consideration, except in so far as they are involved in the first class of phenomena. Cognition is a general name which we may apply to all those mental states in which there is made known in consciousness either some affection or activity of the mind itself, or some external quality or object. The

Psychology of Cognition analyses knowledge into its primary elements, and seeks to ascertain the nature and laws of the processes through which all our knowledge passes in progressing from its simplest to its most elaborate condition. It is necessary for scientific purposes to classify mental phenomena, but it must be borne in mind that in actual consciousness there is no possibility of separating the one from the other, and it is frequently difficult to determine to what class a particular phenomenon belongs. In the earliest or simplest stage of knowledge it is perhaps difficult to say whether the phenomenon should be classed as a Feeling or a Cognition; and, consequently, it will be necessary in this treatise to consider all those primary elements, of whatever character, which enter as constituent parts into our matured knowledge.

No actual separation of mental phenomena possible.

Sources of knowledge regarding the mind.

§ 2. The materials which we shall require in the systematic exposition of our subject are drawn from various sources, but especially the following:—

Consciousness.

a. Examination and analysis of consciousness. This is the power which every individual possesses of becoming aware of the various feelings and other phenomena which are experienced in his mind. It is the only power by which these phenomena can be directly known or studied, and, consequently, in every system of philosophy it must be appealed to as an authoritative revelation of mental facts.

Physical organism.

b. The anatomy and physiology of the physical organism. Without entering into disputed questions it is universally admitted that the powers of the mind are in some way connected with, and depend upon, the faculties of the body, and more especially that the nervous system, with its centre in the ganglia of the brain and its extremities scattered over the surface of the body, is the principal medium of communication with the external world. Whatever may be the value which a knowledge of the laws and operations of this system of nerves possesses, it may cast some light upon the more refined operations of the mind itself.

Results of mental activity.

c. The history of human progress or of the *results* of the continued activity of the human mind. Amongst the most important of these is language. If physiology makes us acquainted with the instrument by which the mind operates, the science of language exhibits and analyses the first and most important of the mind's products. It is only within the last half century that this science has sprung into existence; but the results which it has already attained are of so great importance in illustrating the history and progress of the human mind and the human race, that the most sanguine hopes may be entertained with reference to the achievements which it is yet destined to accomplish.

Progress in other elements of life.

The progress which has been made in different places and under different conditions in the useful and elegant arts, in science, and in social character and customs, may also afford illustrations of the nature and laws of the human mind. The consciousness which each individual possesses of the working of his own mind may be corrected and enlarged by an observation of the gradual and progressive development of the mind of the nation or race. That such progressive development has actually taken place, no one can doubt. The history of religion, of science, of art, as well as of philosophy, is evidence of the fact. To the history of this progress, therefore, the student of philosophy should turn his attention, for in it he will find illustrations, upon a grand scale, of the operation of mental forces and principles which consciousness reveals to him, upon a small scale, in his own mind.

Order of study.

§ 3. Before proceeding to the consideration of the special subjects of psychology, it is desirable to take a general view of the order in which they should be studied.

1. *Criticism of materials.*

In the first place, it will be necessary to examine critically the sources from which facts regarding the mind are derived, in order to determine their value, their bearing upon the questions under examination, and the nature of the information which they are likely to give. The facts revealed to us in consciousness, those made known by a study of our physical organism, and the results of human mental activity, constitute different classes of data from which conclusions may be drawn regarding the operations and laws of the mind. These different classes of facts give testimony of different kinds and of different value; and it will be necessary both to pursue an accurate method in the examination of the facts themselves, and to see that no conclusions which they do not warrant are drawn from them.

2. Analysis of present-ative knowledge,

§ 4. The next step is the analysis of our mental phenomena into their simplest elements. In the maturity of the human mind the feelings, perceptions, thoughts, and other phenomena are very complex in their nature; and we cannot thoroughly understand them until they have been resolved into the elements of which they were originally composed. Having determined as accurately as possible the original elements of our knowledge, we may discover the manner in which these elements are combined or modified so as to constitute what is called presentative knowledge—that is, knowledge which is immediately presented to the mind without having undergone any process of repetition, or comparison, and without having inferences drawn from it. In this reduction of knowledge to its simplest elements we shall be led to study the relations between these ultimate mental facts and the parts of the physical organism with which they are more immediately connected, and we shall be able to trace the first beginnings of our knowledge of external things. It will be necessary also to study another process, the repetition or representation of the original elements of our mental activity, since this process plays an important part in the perception of external and distant objects.

and combination of elements into complex products.

3. Representation of mental phenomena.

§ 5. The repetition or representation of the elements of knowledge, introduced as a subsidiary process in the psychology of perception, must now be studied in its higher and more easily recognised functions as exhibited in phantasy, memory, and

CHAP. I. SECT. I

imagination. These subjects, and certain problems involved in them, form an interesting chapter in the study of the human mind.

4. *Elaboration of knowledge.*

§ 6. The last and highest class of phenomena to which we shall require to turn our attention consists of those complex processes of comparison, generalisation, and inference which are employed in the enlargement and elaboration of our knowledge. The study of the products of these processes is the work of the logician. Logic has to do with the *results* of the mental processes to which we are referring; but psychology is concerned with the *nature* of the processes themselves as revealed in consciousness. While, therefore, the objects of our study here will, to a certain extent, coincide with those of the logician, we shall look upon them from a different point of view. It will be our aim to discover the nature and laws of our mental activity exerted in the formation of those predications, general notions, and inferences which form the subject-matter of logic.

CHAP. I. SECT. II.

SECTION II.

CRITICISM OF SOURCES.

§ 7. In this section it is proposed to examine briefly the sources of our knowledge of the mind, for the purpose of ascertaining the kind and amount of evidence which they are likely to give concerning the mind's processes. These sources we have already arranged into three classes—consciousness, the study of the physical organism, and the results which follow from the mind's activity.

Study of complex mental products.

Beginning with the third of these, as being the most familiar to those who have not devoted much attention to the subject, we may remark that from it we need not expect to obtain much assistance in the study of the more ultimate and elementary phenomena of the human mind. The manifest results of human activity, as seen in language, in mythology, in art, or in religion, are the expression or effects of mental processes of a complex and elaborate kind. They cannot, therefore, throw much light upon the mental problems connected with the first beginnings of knowledge; but they will assist very materially in showing how the more complex mental operations are carried on, how the simpler elements of knowledge are combined and elaborated. Leaving their consideration, therefore, for a future period, we shall examine more carefully the other two sources which we have indicated.

Physical organism: different views of its relation to the mind.

§ 8. A study of the physical organism is without doubt an important preparation for the study of the mind. But the value of the information which it gives has been differently estimated by different students. All are willing to admit that the connection between the body—and especially the nervous system—on the one hand, and the mind on the other, is of a very intimate kind; and all should, therefore, agree that the study of the one is an important condition of a complete knowledge of the other. But there are diversities of opinion as to the nature of the connection between the movements of the nervous system and brain which are distinctly physical, and the elementary phenomena accompanying or following them which are distinctly mental. The following are clearly distinguished doctrines upon the subject:—

(1.) *Mind a function of brain.*

(1.) It is held by some that the mind is a function of the brain. In order to understand this, we must bear in mind the relation between function and organ in the vegetable and animal kingdoms. An organ is a constituent part of an organised body which has some definite duty or function to perform. The function of the leg of an animal is to walk or run; that of the wing of a bird is to beat the air so as to enable the bird to fly. The stomach is a large internal organ of the body, whose function it is to contain the food which we swallow, until it has been prepared for being taken into the blood. The liver is another organ, whose function it is to secrete bile, which is poured into the stomach to assist in the digestion of our food. Every organ has got some special work or function to perform in the body to which it belongs. In the same way, it is argued, the brain has a function to perform in the animal system, and that is to produce the various mental phenomena of which we are conscious. And, acting upon this hasty and crude hypothesis, a set of visionary speculators called phrenologists have thought that they could learn all about the mind, its character, and its laws, by the study of its organ, the brain.*

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* This is the theory of M. Comte, and some of his followers.

There are many objections to this hypothesis, of which we offer the following.

Objections.

The functions of all the organs with which we are acquainted are perceived by us either as some material product or some mode of motion. We are able to examine both the organ and the function as ordinary physical phenomena; both the organ and the function are made known by perception through the senses. But in the case of the brain, the organ is indeed capable of being examined as we examine any other physical organ—by external observation aided by the employment of the dissecting knife. And if we consider the brain as the centre of nervous force by which the muscles of the body are made to contract, we are able to perceive a function of the brain in its result—ordinary muscular motion. But mental phenomena are directly perceived only by consciousness, and are entirely different in kind from any of the functions of physical organs with which we are acquainted.

Again, it is admitted by comparative physiologists that there is a much closer resemblance between the *nerve-systems* of some animals and that of man than can be made out between the *mental operations* of the former and of the latter. The brain-ganglia of some of the anthropoid apes are exceedingly like those of man; but between the mental activity of the one and the other there is an impassable gulf! The organs are very similar; the so-called functions are essentially different.

The absurdity of this hypothesis will be still farther apparent from a consideration of the fact that the alleged function—the mind, actually governs the organ—the brain. The mind consciously determines to act in a certain way, issues its commands to the great centre of nerve-force, the brain, and the nerves and muscles immediately act in obedience to the mandate.

The same objections apply to that modification of this theory which makes mental phenomena a *secretion* from the brain, analogous to the bile and other secretions of the glandular organs of the body.

Hence there is a strong presumption, which may be confirmed as we advance, against the hypothesis that the relation between the nervous system and the phenomena of the mind is identical with, or even analogous to, that between ordinary physical organs and their functions. Consequently, although a knowledge of the nervous system may be of importance to the study of mind, we can attach to it at present but a subordinate degree of importance.

(2.) *Mind and body two independent substances.*

(2.) A second theory of the relation between the mind and the body may be described in the following manner. The mind and the body are two entirely different substances possessing entirely different qualities. The mind has been brought into connection with the body, inhabits the body, and uses the body as its instrument of carrying out its purposes and communicating with the external world; but they are in nature so entirely different, that there is, and can be, no truly causal connection between the phenomena of the one and those of the other. An impression upon an organ is only an occasion on which, by some mysterious power, a sensation is produced in the mind. So the occurrence of a volition or determination in the mind is only an occasion on which, by divine interference, a movement is excited in some of the muscles of the body. The connection between the mind and body is only accidental, and might have been otherwise. The one is now inhabiting and employing the other, but has an existence really independent of the other; and our knowledge of the one cannot be increased to any material extent by a study of the other. Those who hold a theory such as this attach very little importance to the study of the brain and nervous system as subordinate to psychology. It is a degradation of the mind to suppose that any light can be thrown upon its workings by a study of its humble habitation and instrument. Consciousness, therefore, and consciousness alone should be resorted to by the student of psychology.

Cartesian theory.

A theory such as this was held by the older followers of Descartes and the older adherents of the Scottish philosophical school. But there are certain considerations which will prevent us from adopting it as an hypothesis to guide us in our studies. In the first place, the student of psychology has nothing to do with the so-called *substances* of mind or matter; he has to study only the phenomena, the sensations and the qualities which consciousness and perception make known to him. And, again, it is unscientific to *advance to* the study of the mind with certain preformed and crude notions regarding its nature, its independence of matter, and other things; although it is quite possible that more or less definite conclusions regarding these questions may be reached as the result of study. As far as our experience goes, the mind is most intimately connected with our physical organism, and it appears to be the duty of the psychologist to take into account every fact bearing upon his subject, admitted to exist, and learn from it as much as possible. Moreover, it lies within his sphere to study only those phenomena which manifest themselves in our present conditions of existence, and not to speculate or make assertions regarding what might be under other conditions.

(3.) *Mental and cerebral events form two partially co-ordinate series whose relations are not accurately known.*

(3.) A third theory respecting the connection between physical and mental phenomena regards them as simple antecedents and consequents, without predicating anything concerning the difference in their nature except in so far as may be learned from actual observation. A certain physical movement or nervous vibration takes place; it is followed by a sensation. A certain volition is determined in the mind; it is followed by a muscular movement. The psychologist, aided by the physiologist, may legitimately endeavour to discover what particular phenomena of a physical kind always precede or follow certain phenomena of a mental kind, in what order the two series of phenomena occur, and other facts regarding them of a similar kind. But on the other hand, it is not legitimate to assume, without satisfactory reasons, that every mental phenomenon has a physical or nervous antecedent, any more than it is legitimate to take for granted that every organic action is the result of some conscious mental antecedent. As physiologists tell us about certain organic actions which take place in the body altogether independent of any mental determination, so there is an *à priori* probability that there are mental activities which are not connected with any particular physical movements.

Mental events may be without physical antecedents.

This probability is abundantly confirmed from a study of certain classes of mental phenomena which, from their nature, cannot have mere physical antecedents.

Primitive judgments are of this character. The assertion that two lines are equal, that white is different from green, that thunder follows a flash of lightning, express mental judgments which *have for their objects* certain things given in sensation, but are not the causal consequents of these things. The mental judgment is the independent action of the mind regarding the relations of certain objects perceived.

Moral judgments are also of this character. A desire, appetite, or passion takes possession of a person; originating perhaps in some physical condition, it seeks to bend the will so as to secure possession of its object. But conscience intervenes, pronounces the desire, appetite, or passion to be wrong, and forbids its object to be sought after. There you have a desire originating in physical antecedents, strongly influencing the mind towards action; but the intervening moral judgment which pronounces the contemplated action to be wrong and peremptorily forbids it, from what physical antecedent can it proceed? It powerfully and with authority resists the course to which the desire, born of physical conditions, would lead, and hence it *cannot* be the natural consequent of these antecedents.

This third theory of the concomitance of the physical and the mental series of phenomena is the one which appears to us nearest the truth as far as we know it. It asserts nothing regarding the relations of mind and matter except what is discovered or inferred from actual observation; nothing regarding the possible independence of what are actually united. It must be limited, however, to those phenomena in each series which are distinctly shown to have a connection of antecedence or consequence with phenomena of the other series. It is illegitimate to assume that because a certain number of facts in the two series are concomitants, therefore all are so. And it is also illegitimate to assume that because certain facts of the one series *follow* facts of the other, there must therefore be any essential connection between them.

Consciousness.

§ 9. We come now to refer to that source of knowledge regarding the mind which, though last in order of consideration, is first in importance. It is by consciousness only that we can become directly acquainted with mental phenomena. As those phenomena are called physical which can be perceived by the senses either alone or aided by artificial contrivances such as the microscope, so those phenomena are called mental which manifest themselves in consciousness. Since, therefore, consciousness is the only means by which we can become directly cognisant of mental phenomena, it follows that the study of the facts revealed in consciousness must always be the principal method of obtaining psychological knowledge. This study, however, as it is one of great importance, is also one of great difficulty. The art of reflecting upon our own mental operations is one which requires a great deal of attention and cultivation in order that we may become proficient in it. This depends partly upon the fact that the energies of human beings are first, and usually continue to be, directed outwards to other persons and external objects. It requires an effort to turn the attention inwards to the facts of consciousness; and hence in Greece men had attained to a high state of civilisation, and acquired a great deal of knowledge regarding external objects, before any attempt was made to examine and analyse the phenomena of the mind.

Another cause of the difficulty of reflection is the great complexity of the phenomena made known in consciousness. This complexity is twofold. In the first place, phenomena are complex from the fact of a great many of them occurring simultaneously or in immediate succession; and it is difficult to separate them the one from the other, so as to ascertain their mutual relations. And in the second place, certain mental actions which seem at first view to be quite simple are in reality very complex in their origin. It is frequently a matter of great difficulty and delicacy to analyse the history of the mind's ability to perform such actions. We are apt to suppose that, because we can perform them easily and readily now, we were always able to do so; and it is difficult to conceive the condition of our minds when we had not our present ability.

Method of studying phenomena of consciousness.

§ 10. As consciousness is the original and only reliable witness testifying to the facts of the human mind, it is manifestly important that the student should know how to examine this witness, and what kind of facts it might be expected to bear witness to. And in the next section we purpose introducing the student in a general way to the character and elements of consciousness, its legitimate sphere, and the different methods by which its testimony may be interpreted.

SECTION III.

CONSCIOUSNESS.

Its general character and elements.

§ 11. We give our first attention to the general character and elements of this most important source of knowledge regarding the mind. Consciousness is the most general phenomenon of the human mind, and all particular phenomena are

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SECT. III.

but its states or modifications. No mental phenomenon can take place which is not, as it were, a link in the general train of our conscious life, a particular form of consciousness. Hence it is impossible to *define* consciousness in the proper sense of the term, that is, to refer it to a higher class of phenomena of which it is a species. Every particular mental phenomenon involves consciousness; and, on the other hand, there can be no general consciousness which is not some particular phenomenon. Psychologists analyse consciousness into the following elements:—A recognising or knowing subject; a recognised or known modification; and a recognition or knowledge by the subject of the modification. Thus consciousness, or immediate knowledge is, in reality, a relation between two things,—the knowing subject and the known modification or phenomenon. This relation and the terms of it are worthy of very close examination.

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The ego.

The first term of this relation is the knowing subject, the self or ego; the second term consists of the presentations and representations which are known. With reference to the first of these terms it is manifest that it cannot be itself a phenomenon; we could never say that one sensation knows another, or that a thought is aware of a volition, or that any single mental phenomenon cognises any other. It would seem equally absurd to say that the whole collection of phenomena which constitutes our consciousness at any one time *knows* any

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particular phenomenon of the series; or that the whole of our past and present conscious life consisting of all past and all present phenomena cognises any phenomenon now in consciousness. Every single phenomenon is *known*, is an *object* of knowledge; and it is impossible to invest the whole aggregate of phenomena with a power the elements of which are not possessed by them separately. Still further we cannot, by generalisation, from all the past and present aggregate of mental phenomena, obtain an element which can be considered identical with the first term of the relation we are examining. Suppose that, from all past and present mental phenomena, we abstract and generalise Feeling itself, we may have here the highest mental abstraction we can reach, but it is *not* the *self*. Thus we set aside three doctrines which may be held regarding the character of the first term of the relation of knowledge, the knowing subject:—(1) That the subject of consciousness is some particular phenomenon of consciousness; (2) that it is the whole aggregate of mental phenomena past as well as present; (3) that it is some element or characteristic of the mental phenomena, abstracted from particulars, such as Thought or Feeling. All of these propositions we reject, because it is inherently absurd that a single phenomenon, or an aggregate of phenomena, or an abstraction from phenomena, should exercise the function of *knowing*, which *we* are conscious of possessing. There is an element in the relation of immediate knowledge which makes it impossible to explain that relation as existing between mental phenomena simply, or between any combinations of mental phenomena or any abstractions from them.

§ 12. A common man speaking of his mind or feelings would say "*my mind*," or "*my feelings*." He would say "*I* thought so-and-so," or "*I* felt such a sensation," or "*I* was conscious of this smell or that sound." In short, every one thinks and speaks of himself as a *person* not to be identified with his body, nor the series of phenomena which make up what he calls his mind. This reference of all one's feelings and thoughts to *self* is called self-consciousness. The idea of self-hood involves the belief that "I" who am conscious of feelings at the present moment am the same identical being who was conscious at a past time of those feelings which "*I*" remember. This permanence of self in the midst of successive and diverse sensations is the essential element of personality. The idea of self is not that of the sum of the series of feelings which constitute our general consciousness, because it is absurd to speak of the aggregate of a series of feelings being conscious of any one of themselves. Nor is it that of Feeling in general abstracted from particular feelings, because it is absurd to attribute to this or any other abstraction the function of conscious knowledge. In the relation of knowledge there is implied a kind of opposition between self and the sensations of which self is conscious. Sensations past, present, and expected are all referred to self as their possessor and subject. Self is thought to be the *unity* in the midst of *diverse* kinds of sensations, the *permanent* element in the midst of *transient* and *successive* sensations, the *one conscious subject* in the midst of *many known objects*.

"Self" unknowable.

In "self" therefore we have the subjective term of the relation of knowledge; but this term of the relation is so peculiar and remarkable that we must bestow some more attention upon it. We have said that it is not a phenomenon, and it cannot, in any way, be phenomenised so as to become *known*. The function of self is to *know*, and although, in the very act of knowing, a phenomenon arises, yet it is impossible for *that which knows* to set itself over against itself as object and thus become known. Self is the universal relative of all objects,—a something separating itself, as it were, from the phenomena of general consciousness and converting them into objects, but incapable itself of becoming an object. This peculiarity of self makes it the most intractable and puzzling element of our conscious existence. Unknown, but all-knowing, it emerges, as it were, from the midst of the endless variety of phenomenal consciousness, asserting its freedom from phenomenal law, and offering the great miracle of the life with which we are endowed. It is absurd to attempt a scientific definition or exposition of the unknown; but we have the power of studying its function *conscious activity*, and through the study of this function alone can we learn anything about the nature of *that which is conscious.*

Its functions.

§ 13. The function of the subject of knowledge is really the same as the relation between the subject and the objects of knowledge. And it is manifest that this relation must be different from other relations with which we are acquainted, since the subjective term of it is different from any object of our knowledge. Moreover the terms of the relation, under present conditions, are *inseparable,* because the phenomena which we know are themselves comprehended in and to a certain extent identical with the act of knowing. When we feel a smell, the act of feeling and the smell itself appear to be, as it were, different sides of the same phenomenon. When we attempt, therefore, an examination of conscious activity as seen in cognition we cannot very well separate that activity from its objects. We describe the function of self in cognition as conscious activity in order to distinguish it from the *objective* or *passive* element in phenomena. Knowledge is not the reception of images or impressions from without; it is essentially an *activity* of self in relation to things which are not self. This activity is perhaps best described or rather indicated by such terms as *assertion, judgment,* or *predication.* We are conscious of a loud noise; in the act of consciousness there is involved the *assertion* of the existence of the sound. We are conscious of two varying sensations; we *assert* that they differ from one another. We are conscious of a particular smell, colour, figure, and taste; we *assert*—this is a rose. Now without this mental assertion there is no knowledge; the mere appearance in consciousness of some phenomenon which does not call forth a responsive activity is not knowledge. We have therefore in this assertion—this conscious activity indicated by the term assertion—the essential element of that relation existing between subject and object in cognition.

There is a particular feature of this relation of great importance which we may indicate by the term *objectification.* It is essential to knowledge that the object should be put over against the subject,—that the phenomenal activity should be discriminated into subjective and objective elements. This creation of an opposition or antithesis between subject and object, called objectification, is perhaps a result of the conscious activity before described as assertion, or is perhaps identical with it; but it is at least essential to every act of cognition.

Methods of interpreting consciousness.

§ 14. There are three leading methods which psychologists have employed in the interpretation of consciousness, which may be termed respectively the psychological or inductive, the critical and the psychogenetical. According to the first of these methods, particular phenomena of consciousness are subjected to study, and classified according to their resemblances or differences, and from them general laws of thought are derived. Many cases of *causal connection,* for example, are observed, and from them there is generalised the great principle

(1.) Psychological or inductive.

that every event has a cause. Similarly, many material objects are perceived to be extended, and it is concluded, by induction, that all material things are extended, or are perceived as occupying space. Against this method of interpreting consciousness it is objected that it is incapable of explaining the element of *necessity* which is involved in many mental products or laws. Induction alone can only lead to a principle which is *generally* and *probably* true; but there are principles in the human mind which are *universally* and *necessarily* true. For example, all men not only believe, but *must* believe, that every event has a cause; all men not only perceive, but *must* perceive, phenomena under the relations of time and space. Now this element of necessity, it is alleged, does not and cannot arise from an induction from experience. And it is urged by many psychologists, after Kant, that induction alone cannot account for all the facts of our conscious life. These psychologists employ *criticism*, by which they discriminate the phenomena of consciousness into two classes: those which are contingent, the results of mere experience; and those which are necessary, and therefore not the *results* of experience, but rather the *à priori conditions* of experience. By this critical examination of the simple facts of consciousness they are able to account for the elements of necessity and universality in the more complex products of conscious life, while they claim the right of employing the inductive method also wherever it may be applicable.

(2.) *Critical.*

§ 15. The advocates of the psychological method object to the critical, that necessity and universality do not of themselves render it certain that a mental fact is original; complex and derived facts, or phenomena, may also be characterised by necessity. Hence, before we accept any fact or phenomenon as an original and simple datum of consciousness, we must examine into the character and source of its necessity. There is a necessity which results from experience, and which consists simply of an inseparable association; and, in fact, all necessity may result from the application of the laws of association to phenomena. And those who make use of the psychological method try to show that all mental products are the results of experience and association.

Necessity from association.

Now there can be no doubt that the laws of association play a most important part in the formation of the complex contents of our consciousness. Phenomena do not appear in consciousness in an accidental or random order, but there is a mutual connection between them of such a nature that they serve to bring one another before consciousness. When two mental phenomena have been experienced at or about the same time, a bond of connection is formed between them, so that afterwards if one of them is repeated the other is likely to be represented. This link of association between mental phenomena appears to be altogether independent of volition; the associated idea of any particular phenomenon appears in consciousness without any effort of ours, or even in spite of efforts to avoid thinking about it. Illustrations of this association of mental phenomena will readily occur to any one. We have once visited a house, and at the time of our visit something of particular interest to us has occurred. If we ever again visit the house, or even have our thoughts directed to it, the idea of the interesting fact obtrudes itself upon our attention. The various laws by which phenomena are associated together have been sufficiently investigated and are well known. We need not therefore refer to them, but shall proceed to point out a distinction of importance with reference to our present study.

Important distinction.

§ 16. We have to distinguish between what is properly a *mental association* and an *objective connection.* When two or more phenomena have been once or frequently presented together in consciousness, they become connected in representation. But there are two different cases to be considered. Two different phenomena may be, upon one or more occasions, connected together in presentation, but may afterwards become objects of consciousness separately. This we may call the case of *the association of separable phenomena.* On the other hand, two or more phenomena may be so connected together that the one is never presented except in connection with the other, and the association in this case is an *association of inseparable phenomena.* And we must be careful to discriminate between the distinction which we have here drawn between

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separable and inseparable phenomena and another distinction which is considered of great importance by psychologists,—the distinction, viz., between separable and inseparable associations. There may be an *inseparable* association of *separable* phenomena; but as a matter of course, when the phenomena are inseparable in *presentation*, the association of the *representations* is inseparable also. There are many familiar instances of an inseparable association of separable phenomena; a book, a watch, a trinket of any kind, which has been presented to us by a dear friend becomes, in our mind, inseparably associated with the idea of that friend. But quite different from this is the inseparable association of phenomena which are inseparable. Let us study a case.

In our experience we have never been conscious of colour except in connection with extension. No matter how far back in our lives we attempt to reach by the aid of memory, we are incapable of discovering the slightest trace of the possibility of a separation between the two phenomena. We do not remember ever to have seen a colour which was not extended, or an extended figure which was not in some way coloured. Nor is there any indication in history or in language of the existence of any race of human beings in whose minds there was ever conceived the possibility of such a separation. And since the presentation of colour is always combined in our experience with that of extension, it follows as a matter of course that the representations also are always combined.

§ 17. This distinction between an inseparable subjective association and an association of objectively inseparable phenomena is one of great importance. When phenomena which are only occasionally presented together have an affinity for one another so as to cling together in representation, the association is truly and only mental. The possibility of their being separated in presentation shows that their synthesis in association is only a mental one, or at least that the objective union is only accidental. But, on the other hand, when phenomena are always united in presentation and can never by any means be separated, their synthesis is not only or even chiefly mental. The objective inseparable connection is that upon which the subjective association depends. It constitutes a different kind of connection from that which is simply subjective. There is such a decided difference both in degree and in kind between the mental synthesis which we form between two phenomena which have accidentally been brought into contiguity, and that synthesis which exists between two such inseparable phenomena as extension and colour, that no person who has not a particular theory to support, would ever place them in the same category. The inseparability of phenomena in presentation leads, no doubt, to their inseparability in representation; but it also leads to something else, and that is, to the conclusion that the synthesis which binds them together is not a subjective one at all.

Another phase of the same distinction is found

Special and universal associations.

in the distinction between associations which are peculiar to individuals and those which are common to all mankind. All mental associations depend upon the experience of the individual in whose mind they have been formed. Peculiar experiences will therefore produce peculiar associations. Experiences common to all will result in associations common to all. In different zones of the earth's surface and in different countries there are many differences of climate, landscape, means of living, habits and customs which give rise to very varied mental associations. The character of the seasons in India, in Britain, and in Canada presents striking differences, and, in the minds of the inhabitants of these countries respectively, there are consequently very different ideas connected with each of them. The word "water," for example, in the torrid zone, is always associated with fluidity as one of the characteristic qualities constituting the denoted object. But in the temperate and frigid zones, where water frequently assumes a solid form, fluidity is not uniformly associated with the word. Many other examples of variable associations might be given. On the other hand, with the word "air" there are always associated the peculiar sensations or ideas connected with respiration. "The air which we breathe" is a phrase which may be universally employed to express the experience of mankind, the reason of course being that, in our present state of existence and with our present physical constitution, the breathing of air is an essential condition of life. This association of the word "air" with the idea of breathing is quite as inseparable as any association which we could name. It is, moreover, an association formed in the minds of all men without exception; but there are important differences which we shall note between this and other inseparable associations.

§ 18. We have just considered two associations, one of them variable and the other invariable and universal, but both being associations connected with particular objects of our knowledge. The qualities or ideas associated are relative to or representative of particular complex sensations depending upon our present physical constitution. But if we consider the connection between extension and colour we shall be able to note an important difference. The qualities to which we referred as associated with air and water were simply a combination of complex sensations objectified; but here we have a sensation "colour" associated with something which is not a sensation. Extension is neither a sensation nor any combination of sensations, but a certain relation which is seen to exist between objectified sensations, or a form which is perceived in connection with a single sensation. And although the mental association between *air* and *breathing* may be quite as inseparable and universal to the human mind as that between *colour* and *extension*, yet we would never place the objective connection between the first pair in the same category as that between the second pair. The connection between air and breathing is determined to our minds *by the peculiar circumstances in which we are placed as physical beings,* and we can easily imagine other circumstances in which this connection would not exist. But the relation between extension and colour, although neither more objective nor more necessary than the former is determined *by the constitution of our minds with reference to external objects, or the constitution of external objects with reference to our minds.* Hence, since we are unacquainted with any other forms or laws of knowledge except our own, it is impossible for us to conceive that any intelligence could be cognisant of colour without extension; or to state the same thing more abstractly, it is impossible for us to conceive that any intelligence could be cognisant of phenomena except in the relation of difference and co-existence. Thus the connection between extension and colour is characterised by an absolute universality with reference to all intelligence as far as intelligence can be understood by us; while that between air and breathing has only a contingent universality with reference to beings who may possess bodies constituted as ours are.

We have endeavoured to show that the connection between extension and colour is not a case of mental association and cannot be resolved into association. Objectively the two things are absolutely inseparable; and subjectively the relation of extension depends upon the primary relation of co-existence which we have seen is an *à priori* condition of our constitution as capable of knowing. But if this doctrine be correct, we have here an original fact of our consciousness which the psychological method of Mr. Mill fails to interpret. And until this method explains satisfactorily the inseparability of colour and extension both objectively and subjectively, we cannot admit that it is adequate to the interpretation of all the facts of our consciousness. This case of inseparability is only one of those which might be adduced as being insoluble by the psychological method. We have chosen to examine it thus fully because it is perhaps the most important. And as, until the above doctrines are overthrown, the psychological method must be considered unsatisfactory, we shall now proceed to the consideration of another method, *the Psychogenetical.*

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(3.) *Psychogenetical.*

§ 19. Those who adopt this method admit that there are mental facts and products which cannot be explained by the principles of association. Neither the form nor the matter of our knowledge is the result of our individual experience merely. We are born with a certain constitution, mental and physical, and the nature and extent of our subsequent acquirements in knowledge and practical ability depend upon our inherited constitution. In other words, it is admitted that individuals possess certain *à priori* principles and tendencies by which the phenomena of their consciousness are determined and governed. This admission, made by such psychologists as Herbert Spencer and G. H. Lewes, is a tacit acknowledgment of the essential truthfulness of the position held by those who have adopted the critical method. But, while admitting this, the psychogenetical method attempts to trace the origin of the *à priori* conditions and principles of our nature to a very remote source. The accumulated experience of the past ages of human history, as well as of the past ages, countless in length and impenetrable to human knowledge, of brute history, is called upon for an explanation of the origin of that physical, intellectual, and social nature with which we are born into the world. It is assumed that lower living forms develop themselves into the higher, that the experience of individuals and races gradually produces organic changes which are transmitted to successors, and that thus, by the natural transmission of organic structures produced or modified by incessant experience, all the higher forms of life and mind have been produced. An adequate examination of this ambitious method would carry us far beyond our allotted space and our object; but we offer the following observations with reference to it.

Objections.

1. The problem attempted by this method is practically an impossible one. We are not able to trace the series of changes asserted to have taken place. It cannot be established that experience gives rise to the structural changes in the organism said to be the result of it. The pheno-

mena requiring to be studied in a satisfactory employment of the method are too remote from possible observation to be used as the foundation of a *science.* Even if we attempt to study the organic changes produced by experience in human beings now living we cannot succeed; and any dogmatic assertions made regarding them must be rash and vain. Much more must this be the case with reference to races of men and animals which existed in a remote past antiquity. Consequently the researches carried on in accordance with this method are nothing better than ambitious and perfectly uncertain speculations.

2. Against the fundamental assumptions of this method it may be alleged that mental phenomena do not, in some cases at least, correspond to organic structure. It is now universally admitted that the brain and nervous system of the anthropoid ape is exceedingly similar to that of man, whereas the mental functions of the latter are almost infinitely in advance of those of the former. This fact is quite inconsistent with the fundamental assumption of the psychogenetical method.

3. If experience in past ages has given rise to necessary truths and *à priori* conditions of thought and knowledge, we might reasonably expect that these *à priori* principles should continue to be produced in our own age. While it may be admitted that some particular tendencies and abilities may be acquired and transmitted, it has not been shown that the essential and universal laws of human

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intelligence have suffered the slightest change since man came into being.

From these considerations we should be inclined to reject the psychogenetical method as impracticable, possibly false, and quite incompatible with that desire to attain *certain* conclusions which ought to characterise men of *science*. And we are now driven back to the critical method of Kant and Hamilton which we adopt as correct and adequate, with the following reservations:

1. The adoption of this method does not commit us to all the results of criticism which those who have hitherto employed the method have reached. It may be that mistakes have been made in discriminating between facts of consciousness as original and acquired, simple and complex, that some phenomena have been regarded as original and simple which are really derived and complex. But this admission does not detract from the value of the method.

2. The adoption of the critical method does not prevent us from making use of the principles of association as far as they are applicable. It is not an essential principle of this method that anything which is now found to be necessary must be an original necessity of intelligence. And if any necessity of thought or knowledge can be explained by the laws of association or any other principles of experience, it ought unquestionably so to be explained. But the critical method insists upon distinguishing between such explicable necessities

of thought, and an inexplicable residue of necessities which, from their nature, must be taken as *à priori* and founded in the constitution of our intelligence.

3. The critical method, while it looks principally to the phenomena of consciousness as the materials with which it has to deal, is not inconsistent with a careful study of the organism and cosmic forces and laws in so far as these may throw light upon the problems to be solved.

In this section, for the sake of the completeness of our study of the subject, we have been led into a discussion, which at this stage of the student's progress can scarcely be very intelligible to him, that is, if he be new to the study of psychology. We should recommend, therefore, a brief and general study of the section, upon first reading, to be followed by a more careful examination afterwards.

CHAPTER II.

THE ACQUISITION OF PRESENTATIVE KNOWLEDGE.

SECTION I.

ANALYSIS OF PERCEPTION.

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Example of analysis.

§ 20. By way of introducing the problems connected with this subject, let us begin with a particular example. Suppose that we see a flowering tree in full bloom a short distance in front of us. The cylindrical trunk, the branching stems, the foliage, the numerous clusters of flowers form a very beautiful object to the eye. The flowers are odorous; the wind is blowing from the direction of the tree towards us; and a pleasing perfume is wafted into contact with our olfactory nerves, giving us the sensation of an agreeable smell. The wind which brings the perfume of the flowers causes the innumerable leaves of the tree to flutter, and thus produces that pleasant murmuring sound of fluttering leaves with which every one is familiar. The tree, we have supposed, is at a short distance from us. This means, that if we walk a short distance towards the object which we see, we shall be able to touch it. Acting upon this hint, we advance and touch one of the leaves of a branch hanging near the ground. A slight sensation is felt on the point of the finger. We touch the trunk and press against it; it resists our pressure; it is hard. We move our hand over its surface, pressing lightly against it, and discover that there are inequalities in it, the tactual sensation being here and there interrupted; in other words, the bark of the tree is rough. Our curiosity is not yet satisfied, and so we pluck a cluster of the flowers, put one of the coloured petals into the mouth and chew it; it is pleasant to the taste. All our senses having been thus brought into exercise, we take our seat upon a mossy hillock near by, and reflect upon what we have been doing.

Analysis explained.

§ 21. The complex activity which has given us a more or less complete knowledge of the qualities of the tree is called perception. And this perception is, of course, most complete when, with each of our senses, we have become directly acquainted with that quality of the tree which is capable of being perceived by it. Three of these qualities we have seen are capable of affecting us at a distance—the colour, the smell, and the sound. The remaining two, the touch and the taste, require, as their conditions, that we shall advance to the tree and bring parts of it into immediate contact with our organs of sensation. Thus, touch and taste of themselves bring to our knowledge objects at no greater distance than we are able to reach our hands—the latter, indeed, at no distance at all. Sight, smell, and hearing give us a knowledge of colours, odours, and sounds, and these qualities are perceived as at a distance from us. But a little reflection will convince us that the sensations which we experience through these senses are really felt within our own bodies, although apparently the causes of those sensations exist at a distance from us. The colour which we perceive appears, as it were, spread over that object whose different other qualities we smell, hear, touch, and taste. But we observe that its apparent colour varies according to the amount and kind of light which is thrown upon it; and scientific men assure us that the white light of the sun is compounded of three or seven elementary colours; that green leaves absorb all these colours except green, which is reflected from their surface, and, falling upon the retinæ of our eyes, produces the sensation of greenness; so the sensation of any other colour is produced by the light from that colour falling upon our organ of sight. Thus we learn from our own reflections, or from the discoveries of scientific men regarding light, that all sensations of colour are felt in and by means of our eyes. These sensations are what we directly know, because we are conscious of them. And as we have seen that by consciousness we can only know what is immediately present to our minds, it follows that the perception of the tree as at a distance must be accomplished by means of some other power than consciousness.

A similar line of reflection or observation will lead us to the conclusion that the sensations of smell and sound also are felt within, and by means of, our organism. And the sensations of touch and taste are, from their nature, seen at once to be organic, since their objects must be in immediate contact with the senses.

Thus we see that what we may call a complete perception of the tree may be resolved into sensations of the several senses and the elements of distance in space or the occupation of a certain part of space without us. But we may say that we perceive the tree, although all our senses are not actually engaged; if we simply look at it from a distance we are said to perceive it. Although in this case, we see only a certain coloured figure which we believe to be at a distance, yet we know that if we pass through the intervening distance we shall be able to touch a hard and rough object and taste the green leaves. And in the same way, if our eyes are shut and we smell the perfume of the flowers, we know that we are not far from some object which we might see, and touch, and taste. So, likewise, with all our senses. If by any one of our senses a sensation is experienced, we immediately conclude that there is some object outside of us which is capable of affecting our other senses; and our perception of the object is more or less complete, according as more or fewer of our other senses have been affected by it.

Now, there is nothing more certain than that by each sense we can have only that kind of sensation which is proper to it. By sight we can only know colour, by smell only odour, by hearing only sound, and so on. Yet when the object of sight or of any of the other senses is familiar to us, the one sensation which we can obtain by that sense calls up before our minds the ideas of a number of other sensations which we do not actually experience, but which we know we may experience if we fulfil the necessary conditions. These sensations, not actually experienced, but simply imagined, we may call ideal sensations. And so the result of our reflection upon the nature of the process of perception may be summed up thus:—In perception there is felt a sensation which is objectified or referred to some external object; it also calls up ideal sensations of the other senses which are referred to the same object, and these ideal sensations are believed to be capable of realisation if the proper steps be taken: the object of perception is thus a collection of objectified sensations united into a whole and believed to exist in space.

Result.

Subjects of inquiry regarding sensations.

§ 22. From this analysis of the process of perception and its object we may trace out a series of investigations regarding the different parts of the process. Sensations themselves are known to us only in consciousness; they are mental phenomena. Our inquiries regarding them will have reference to their nature, their relations to one another, and to consciousness in which they are known. We must endeavour to learn also the nature and mode of their connection with the physical organism, the nature of the process which we have called objectification which plays such an important part in perception, and the manner in which objectified sensations become united together in the object of perception. And since we have sensations succeeding one another in time and objectified into space, the nature and origin of our ideas of time and space must occupy a prominent position in our investigations.

SECTION II.

ANALYSIS OF SENSATION.

Sensations described.

§ 23. As we have seen that our perception of external objects may, by analysis, be reduced to organic sensations,* along with a conception of space, we must now give some attention to sensations themselves. By sensations we mean those feelings or states of consciousness which, as we learn from physiology, are connected with certain nervous movements in our physical organism. Light, for example, is reflected from some external object and falls upon the retinæ of our eyes. The minute fibrils of the optic nerve spread over the retina are *sensitive* to the light which falls upon them, and a nervous current of some kind is propagated to the brain. The nervous action having taken place, the sensation of light or colour is felt. So there is reason to believe that all sensations are connected in a similar manner with certain bodily conditions. A fuller discussion of the circumstances of this connection will be attempted hereafter. But, in the meantime, it must be borne in mind that this *reference to nervous activity as preceding sensation is no explanation whatever of sensation in itself, but simply of the physical conditions upon which sensation is felt in consciousness.* A sensation can be known only in consciousness, and as sensations are the simplest mental facts which consciousness affords, we cannot resolve them into any simpler elements, although it is possible that some complex sensations may be reducible to simpler ones. Our analysis of sensation will therefore be completed when we have—(1) arranged them into clearly-defined classes; (2) resolved complex sensations into their simpler elements as far as can be done; and (3) determined how far this resolution can be effected, and especially if conscious sensations can be legitimately analysed into elements of which we are not conscious.

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* Sensations felt in consciousness but localised in the organism.

Classification of sensations.

§ 24. Everyone is familiar with the five senses, or gateways of knowledge, as they have been called, by which we know the qualities of the external world. But, in addition to the sensations connected with these senses, it has been found necessary to form another class comprehending a variety of sensations clearly distinguished from the former. This class comprises all the sensations connected with the different parts of the organism with the exception of the five senses. This class and the sensations comprehended in it have been denominated variously, the vital sense, the organic sense, the sensations of organic life, &c. A clear view of the great variety of sensations of which we are conscious may be obtained by the study of the following table:—

Sensations.	I. Of Organic Life.	1. Connected with the bones, tendons, &c.	
		2. Connected with the nervous system.	
		3. Connected with circulation and nutrition.	
		4. Connected with the general state of organs, as heat, &c.	
		5. Connected with the respiration.	
		6. Connected with digestion.	
	II. Of Intellectual Life.	1. Organico-Intellectual.	*a.* Smell. *b.* Taste.
		2. Intellectual.	*c.* Touch. *d.* Hearing. *e.* Sight.

I. From a glance at the parts of the organism referred to in this class, it will be readily apparent what sensations are indicated. The organs concerned in muscular exertion give rise to different sensations when in a state of repose, when active, when fatigued, and when resting after labour. The nervous system may suffer excitement or depression in various degrees or manners, and give rise to a variety of sensations. Hunger, thirst, and their opposites, with the sensations connected with them, depend upon certain states of nutrition and circulation. From a general condition of the body, which cannot be very clearly defined, there arise feelings of languor or the opposite, and also heat and cold; the sensations of the latter kind being, however, chiefly felt in the skin. The respiratory system is the seat of a class of sensations such as that of suffocation, and there are sensations also connected with the digestive organs. The general characteristics of these sensations are that they arise in the organism itself as the concomitants of vital operations, and that they are accompaniments, results, or stimulants of action, not elements of knowledge, *i.e.*, of knowledge regarding extra-organic objects; but they are elements of our knowledge of the organism.

II. The sensations of intellectual life are those whose chief end appears to be the imparting of knowledge regarding external things.

Senses of smell and taste.

1. Two of these senses are so closely connected with the respiratory and digestive systems, and give us comparatively so little extra-organic knowledge, that their sensations occupy a middle position between those of the first class and those of the more intellectual senses which we have placed last in order. The sense of smell, placed at the portal of the respiratory organs, gives notice of the entrance of any noxious vapour into the lungs, and occasions the sensation of smell when any odorous emanations come into contact with the olfactory nerves. "The sense of taste is that by which we distinguish the *sapid* properties of bodies. The term, as commonly understood, includes much more than this; being usually employed to designate the whole of that knowledge of the qualities of a body (except such as is purely tactile) which we derive through the sensory apparatus situated within the mouth. But this is dependent upon the

assistance of the olfactive sense, which is affected by the odorous emanations of all such bodies as are capable of giving them off; and the indications of which are so combined with those of the true gustative sense as to make an apparently single impression upon the sensorium. Moreover, there are certain sensorial impressions received through the organ of taste, which are so nearly allied in their character to those of *touch*, as to render it difficult to specify any fundamental difference between them; such are the *pungent* sensations produced by mustard, pepper, the essential oils, &c., all of which substances, when applied for a sufficient length of time to any part of the cutaneous surface, produce a sensation which can scarcely be distinguished from that excited through the organs of taste, in any other way than by its inferior intensity, and by the absence of the concurrent odorous emanations. The *taste* of such substances might, therefore, perhaps be considered as the composite result of the impressions made upon the sensorium through a refined and acute touch, and by the effect of their odorous emanations upon the organ of smell."*

The sensations both of smell and taste may be arranged in a loose popular way into subordinate classes; such as pungent, acrid, sweet, &c. But as no classification having any pretence to scientific accuracy and exhaustiveness has yet been offered, the subject does not demand much of our attention.

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* Carpenter, "Human Physiology," p. 177.

It may be remarked by the way that there *are* certain well-defined classes, inasmuch as the sensations of one class, such as the bitter, cannot, by any means of which we are aware, be transformed into those of another.

Original distinguished from acquired knowledge in sensation.

2. We now come to the study of the sensations of the more intellectual of the special senses—touch, hearing, and sight. And it will be necessary to distinguish carefully between those which are proper and original to those senses and those which are acquired. We have seen already that in the case of two of these senses, hearing and sight, the sensation undergoes a process of objectification, being referred to a distance. In the case of touch this is not so obvious, although it is still true to a certain extent. The sensation of pressure, which is in itself purely organic, is referred to something not at a distance, it is true, but still external to the organism. Now, in each of these cases the objectification of the sensation, not being original, must be distinguished from the sensation itself.

Sense of touch.

The sense of Touch has, as its proper organ, the skin, which "is peculiarly adapted for this purpose, not merely by the large amount of sensory nervous fibres which are distributed in its substance, but also by its possession of a papillary apparatus in which these nerves for the most part terminate, or rather commence." The tactual sensation proper is that which is felt when any body slightly comes into contact with the skin so as to make its presence felt. But this tactual sensation is often combined and confounded with others of a different kind. When, for example, the point of the finger is *pressed* against the table, in addition to the tactual sensation, there is a feeling of *resistance* or *hardness* which is manifestly the sensation of muscular exertion objectified. Where the finger is rubbed over the surface of a rough body there is also a combination of the tactual sensation with that of muscular exertion.

The skin is also the principal seat of the sensations of heat and cold, and when an object which differs in temperature from that of our body is brought into contact with it these sensations are experienced. But although the nerves of the tactual sensation are susceptible also to heat and cold, the two kinds of sensations are essentially unlike.

Sense of hearing.

From descriptions of the organ of hearing given by physiologists, we learn that it is a very delicate organ of touch. The object of hearing is sound; and the physical conditions of sound are vibrations of some material body which affect the air, and are propagated by it to the ear. The sensations of sound may vary in many ways, according to the nature of the sounds which are heard. The principal characteristics of *single* sounds are pitch or tone, clearness, volume or quantity. Two or more *simultaneous sounds* are harmonious or discordant. The pitch or tone of a sound is determined by the number of vibrations of the air which strike upon the ear in a second, and by many experiments this has been accurately determined. The other qualities of sound appear to depend to a great extent upon the material and size of the vibrating body.

The knowledge of the distance and direction of the body which causes the vibrations of the air is obtained by experience,* and the ability to detect slight differences between successive sounds and the harmony or discord of simultaneous ones is also to a certain extent an acquired power. We are concerned at present only with the sensations in their original simplicity which are marked by clear differences from those of every other sense, and discriminated from one another by many distinctions of pitch, strength, clearness, volume, and quality.

Sense of sight.

The proper object of the sense of sight is light or colour; and the physical conditions of sensation are the emission or reflection of rays of light from some external body, and the transmission of these rays to the retina of the eye. Those who have studied the laws of light tell us that the colour of bodies depends upon the nature of their reflecting power. Some bodies, such as mirrors, reflect light without producing any change upon it; others absorb and partly re-emit the light which falls upon them. Amongst this latter class, different bodies possess different powers of absorption and reflection; and, in consequence of this difference, the white light which falls upon them is variously modified before reflection, and, falling upon the retina of the eye, gives rise to the sensation of colour. "We all know that a ray of white light may be divided with a prism into several rays of different colours. It spreads out into a spectrum, in which the colours form a continuous scale. At the commencement of the scale is red, then come orange and the different yellows, then green, the different blues, indigo, and, lastly, violet, and each of these tints passes, by intermediate stages, into the one preceding it and the one following it. The science of optics shows us that the spectrum is formed by the different rays which make up the white ray being inflected, some more and some less, in passing through the prism; this inflection increases with the shortness and rapidity of the waves; therefore, if we follow, from red to violet, the series of rays which form the spectrum, we find the shortening and acceleration of the waves go on increasing. Thus from red to violet, each sensation corresponds to waves quicker and shorter than those of the preceding sensation, slower and longer than those of the succeeding sensation. An increase of speed and diminution of length in the waves are sufficient to determine the variations which our sensation of colour undergoes in passing from red to violet." *

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* Of course we must postulate the possession of a suitable organism to render this experience possible.

Analysis of sensation.

§ 25. The resolution of sensations into simpler elements is shown to be possible most clearly with reference to the senses of hearing and sight. In connection with the former, everyone is familiar with what we call a musical sound. That this sound is really a complex sensation is shown in several ways, and amongst others by experiments with the wheel of Savart. This wheel is a flat circular steel plate, having its circular edge cut to some depth into fine elastic teeth, and made to revolve with great rapidity upon an axle. "When this wheel is turned at an uniform rate, its teeth, which are at equal distances, strike a bar in passing; and this regular succession of similar concussions excites a regular succession of similar sensations of sound. Now, while the wheel turns sufficiently slowly, the sensations, being discontinuous, are distinct, and each of them, being compound, is a sound. But when the wheel is set to turn fast enough, *a new sensation arises*, that of a musical note. It distinguishes itself from the remains of the noises which still go on and continue distinct, and stands out as a fact of a different kind; among the different elementary sensations which make up each sound, there is one which the operation has separated; and this now ceases to be distinct from the *similar elementary sensation* following in each of the succeeding sounds. *All these similar sensations now combine in one long continuous sensation*—their mutual limits are effaced; experience, just as in a chemical analysis, has extracted an elementary sensation from the complex group in which it was included, has joined it to an absolutely similar elementary sensation and formed a new compound—the sensation of musical sound."* Thus it is seen that a particular sensation, that of a musical note, is capable of being resolved into more

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* Taine, "On Intelligence," p. 117.

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* Taine, "On Intelligence," p. 108.

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elementary sensations, each of which is distinctly in consciousness. If we now examine a sensation of light, we shall see that it also is resolvable into more elementary sensations. The resolution of the sensation is effected by the resolution of its most important condition, the ray of light. The prismatic spectrum comprehends a variety of distinct sensations which, previous to the analysis, must have been contained in the complex sensation of white light. A well-known optical toy, consisting of a disc of card-paper with the spectral colours painted upon it, and made to revolve rapidly upon its axis, shows that the separate sensations may by rapidity of succession become blended together again and form one complex sensation more or less closely resembling the original one. The proper mixing of colours is an important part of the oil-painter's art, and in this there is a complex sensation produced by the mixing together in proper proportions of the oils, which, taken separately, would produce a simple, or at least a less complex, sensation.

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We thus see that in many cases the sensations of the two most noble senses may be shown to be composed of more simple elements, being, however, still sensations. A similar course of investigation, regarding the sensations of taste, smell, and of organic life, would probably show that in all these cases there are many complex sensations which are capable of resolution. But it is needless to continue the investigation farther, as we have already sufficiently established our conclusion, which may be thus stated :—

Result of Analysis.

(1). There are in consciousness sensations of a complex character, which, as far as consciousness is concerned, appear to be simple.

(2). The resolution of these complex states of consciousness cannot be effected by consciousness alone, but by applying the methods of physical science to the physical conditions of these states of consciousness.

(3). Hence, we may conclude the possibility of there being other complex states of consciousness, which, by mere reflection, cannot be analysed into their component elements.

Analysis into unconscious but mental elements considered.

§ 26. We now consider the possibility and legitimacy of analysing sensations into elements which are not, and cannot, be brought within the sphere of consciousness.*

Suppose that the point of a needle has been made so small, that when it is held in a clear light, directly before the eye, it is just visible, and no more. Upon the principle of the infinite divisibility of matter, this point may be divided into two halves, each of which is invisible. Or, suppose that in the wheel of Savart, referred to above, all the teeth except two have been broken off, and the concussion of two teeth upon the bar is necessary to produce an audible sound. If one of these teeth be broken, the vibration of the remaining one will be inaudible. In both of these cases, and in others which might be mentioned, a certain *amount* of physical antecedent is necessary as a condition of *conscious* sensation. And the question is, May that conscious sensation be resolved into *mental* elements of which we are not conscious? By some it is held that this resolution is not only possible, but necessary to explain the phenomenon. Against this view the following objections may be urged:

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* The doctrine of latent mental modification held by Sir W. Hamilton and others, asserts that underlying the sphere of our conscious activity there is a still more extensive sphere of *mental* activity, of which we are never conscious, but the results of which manifest themselves in consciousness.

Objections.

(1). The essential character of a sensation is that it is felt, and felt consciously. Therefore to analyse sensations into elements of which we cannot be conscious is not legitimate.*

(2). There are other possible explanations of the difficulty. It may be that the object from which the light is reflected, or from which the vibration of the air proceeds, produces such a slight agitation of the intervening medium that it is spent or dispersed before it reaches the organ of sense. Or, suppose the agitation of the ether or air to reach the nerve of sense, it may be that the impression upon the nerve is so slight, that no vibration is propagated to the nerve centre in the brain, or that the vibration is so exceedingly slight as not to be a sufficient condition of sensation. And that either of these suppositions is the true one, appears to be supported by the fact, that certain artificial appliances, such as the microscope, collect or intensify the physical conditions of sensation, so that what was before invisible or inaudible, may be distinctly seen or heard. The rays of light falling from a point invisible to the naked eye, are collected and condensed by the microscope so as effectually to impress the optic nerve, from which we naturally conclude that previous to the use of the instrument the vibrations of the ether were so slight as not at all, or not sufficiently, to impress the nerve. It is possible, also, that there may be an excitement of nervous activity, either in the brain or the nervous fibres, but which is not a sufficient condition of sensation. In the meantime, we may conclude that the most probable reason why, in certain cases, a conscious sensation does not take place, is that the physical conditions, whether here or there, whether nervous or extra-organic, are inadequate.

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* This objection, however, does not hold good against the possible latency of other forms of mental activity. There may be an activity of the ego which has no physical antecedent, and such activity may leave its trace not in the brain but in the spiritual nature beyond the sphere of consciousness.

Section III.

REPRESENTATION OF SENSATIONS.

Revived sensations described.

§ 27. The possibility of the revival of a sensation once experienced is a fact familiar to everyone. But the sensation as revived is not the same as when actually experienced. It is idealised, it appears more refined, farther removed from sense than it was originally. Illustrations of this are numerous and familiar. If we have once seen a fine building which has made a great impression upon us by its architectural beauty, a very slight effort will serve to recall before our minds its colours and outlines. We imagine that we almost see it. So of sounds. We are familiar with the voice of a friend; in his absence it is quite easy to recall the tones and quality of his voice; we fancy that we hear him speaking. Other sensations of taste, smell and touch, are capable of revival in a similar manner, some more vividly, more approaching the original than others, but all to a greater or less extent. In all these cases the phenomenon, the revived sensation, is recognised as related to the original one—a repetition of it, but different from it. Moreover, the sensation revived appears always to be connected with the same organ as when originally experienced.

Physical condition of revival.

§ 28. The physical condition of the revival of sensations is probably some agitation of the same nerves as served for the physical condition of the original sensation. The researches of physiologists, however, appear to lead to the conclusion that a particular part of the brain, the cerebral lobes, is designed to prolong and repeat the action of the nerves of the senses. And many philosophers, assuming that they know the functions of the different parts of the nervous system, have given minute elaborate explanations of the nervous motions which take place in correlation with the revival and varied combination of our sensations. A distinguished writer, who has made a great use of physiology in the explanation of psychical phenomena, has well expressed the indirectness and obscurity of our knowledge of the relation of nervous action to feeling in the following sentences:—

Correlation of nervous with psychical action indirectly inferred and not more than probable.

(1.) "Each individual is absolutely incapable of knowing any feelings but his own. That there exist other sensations and emotions, is a conclusion implying, in the first place, the reasoning through which he identifies certain objects as bodies of like nature with his own body; and implying, in the second place, the further reasonings which convince him that along with the external actions of these bodies, there go internal states of consciousness like those accompanying such external actions of his own body. (2.) This conclusion, that there exist beings like himself, and that under like conditions they experience like feelings, even supposing it entirely true (and it is not entirely true, for many facts unite to prove that, under like conditions, both the quantities and the qualities of sensations and emotions in different individuals differ considerably), by no means implies that what he knows under its subjective aspect as feeling is, under its objective aspect, nervous action. The average observer has not direct evidence that these other like beings have nervous systems, any more than that he himself has a nervous system, and he has no direct evidence in the one case any more than in the other, that nervous excitations are the causes of feelings. Experimental physiologists and pathologists only have proofs, and even their proofs are mostly indirect. The experiments which yield them are usually made on beings of another and much inferior order. The contractions of muscles and arteries, caused by irritating nerve-trunks in frogs, the convulsive movements, and sometimes the sounds made by birds and mammals whose nerve centres are variously injured—these are the phenomena from which it is inferred that the human nervous system is the seat of the human feelings, and that these feelings are the correlations of its excitations. The only important verifications of the inference being those obtained during surgical operations where nerve-trunks are cut through, and those furnished by *post-mortem* examinations of morbid nervous structures in the bodies of those who, when alive, displayed abnormal excesses or defects of feeling. (3.) And then, having learnt at second-hand, through the remotely inferential interpretation of verbal signs, that in now one and now another of the bodies he recognises as like his own there has been found a nervous system, and that the stimulations of this produce those manifestations which, in himself, accompany feelings, the reader imagines a nervous system contained in his own body, and concludes that his sensations and emotions are due to the disturbances which the outer world sets up at its periphery and arouses by indirect processes in its centres."* Considering, then, the small number of facts bearing upon the question which physiologists have been able to observe, the indirectness of the observations which have been made, and the obscure, infinitesimal character of the movements themselves, it appears impossible to determine with any degree of scientific accuracy the precise physical antecedents of those mental actions which are in a greater or less degree removed from sense. The attempts which have been made to do this are, and, from the nature of the case, can be, little more than conjectures founded upon uncertain analogies and few and crude observations. And although the facts which are known and admitted may warrant a general belief that the lower forms of mental activity, such as reviving sensations, have special physical antecedents, yet there does not appear to be a sufficient groundwork of facts to justify us in constructing an elaborate and detailed theory regarding their correlation. Consciousness is the only direct and reliable revealer of mental facts, and although we may sometimes be assisted in our study of consciousness by the facts and observations of physiology, an attempt to make these the foundation of mental science is directly to reverse the natural order of things. Leaving out of account, then, the correlation, or inferred correlation, between physical and mental events, as only of secondary and occasional importance in the explication of our subject, we proceed to the study of the revival and association of our sensations as revealed in consciousness.

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* Herbert Spencer's "El. of Psych.," i., pp. 99-100.

Nature and relations of idealised sensations.

§ 29. If a clear bright light be kept for a short time before the eye, and then removed, the sensation produced will persist for a time, and at intervals, perhaps, be revived. The same is the case with tastes, smells, and other sensations. But the sensation, as persistent or revived, is not so clear and vivid as it was originally—it has become idealised. The appearance before consciousness of idealised sensations is not fortuitous, but takes place in certain regular and connected series. Sensations of different *quality*, that is of different senses, are connected together, so that an actual sensation of one kind will serve to introduce, before consciousness, idealised sensations of other kinds. The sight of a particular kind of fruit with which we are acquainted, at once makes us think of its smell and taste. Thus, there are certain fixed groups of sensations which we regularly experience together, the different members of the group differing in quality. We have a complete knowledge of one of these groups, when we have once become conscious of all the sensations comprehended in it. And afterwards when any one of these sensations is actually felt, we know what the rest of the group are like. But it is not necessary that one of the original group should be actually felt in order that the whole may be ideally recalled. If a particular sign, as, for example, the word *orange*, have become attached to a certain group of sensations, the repetition of the sign will serve to recall the whole group quite as really as the consciousness of any one of the sensations of the group. Thus, a sign of a group of sensations becomes by association, as it were, a part of the group, and our curiosity regarding a sensation is satisfied when we are able to refer it to a certain known group of sensations, and to attach to the group the sign by which it is usually designated. When a new sensation is experienced, our curiosity is excited because we do not know the other sensations which are regularly connected with it, or the sign, or name, by which the whole is denoted. Thus our knowledge of a sensation resolves itself into a knowledge of its quality, and a knowledge of the position or relation which it holds amongst other actual or idealised sensations.

Order of sensations:

§ 30. There is a twofold order in which series or groups of sensations may appear in consciousness. They may be successive, or they may be simultaneous. In the meantime we give our attention to the first of these orders. A single sensation of any kind may persist or may be revived. An

successive,

actual or revived sensation may call up in succession a series of other revived sensations of different kinds which we distinctly recognise as having been at one time actual. This successive order of sensations, or revived sensations, involves the conception of *time*, and is the only means which we have of determining time. When we experience one of a group of sensations with which we are well acquainted, we recognise it as something which we have felt before, and we give it a position more or less definite amongst other previously experienced sensations; in other words, we remember it. Thus,

memory,

memory, in this reference, is the ability to determine the position of a sensation in a successive past series of sensations. But idealised sensations may be referred also to a future time, that is, to some future succession of ideal sensation which we think likely to be realised, and this is what we call expectation. Thus with reference to this subject, memory and expectation consist in the ability to place an ideal sensation into that position in the series of successive sensations which, in the one case, we believe with certainty were actually experienced during a time past, and in the other, we expect with greater or less assurance will be experienced during some future time.

and expectation.

Independence of the order of sensations.

§ 31. We thus arrive at the conclusion that sensations become so connected together in groups, that one of a group is capable of reviving before consciousness all the others. But although we may describe these sensations as being *our* mental phenomena, we cannot determine what particular sensations shall constitute particular groups. This is done for us by nature; or, in other words, there is a natural grouping of sensations in which we cannot, as a rule, produce any essential change. By experience only can we come to know the constituent elements of a group, and by frequently experiencing naturally connected groups of sensations, a subjective association such as we have described comes to be formed between them. The succession of sensations before consciousness gives us time. The positing of an ideal sensation in the midst of a group recognised as having had a past existence, or as likely to have a future existence, is memory or expectation. This mental process, it must be borne in mind, as referred to here, is subsidiary to the acquisition of presentative knowledge, as we shall presently see. In the meantime, we are not supposed to know anything except sensations, revived sensations, and the relations which they bear to one another in kind, in time, and as members of associated groups.*

Section IV.

SENSATIONS AS OBJECTS.

Meaning of object.

§ 32. We have hitherto been considering sensations merely as differing from one another in kind, and as succeeding one another in time, but in our analysis of self-consciousness † we saw that they are necessarily looked upon as being objects related to and known by the subject, self. We must now examine them more carefully in their character as objects of consciousness, in order to see if anything is involved in them which will help us in the explication of the process of acquiring our presentative knowledge. And the very word *object*, contradistinguished as it is from *subject*, appears to indicate an element in our sensations which may be of great importance. It indicates that sensations are possessed of an element *foreign* to the subject knowing; they are regarded as being *not-self.* There are besides, other features of sensations which render more complete their character of objectivity. Individual sensations cannot be created or annihilated at pleasure. We may, it is true, interfere with the physical conditions of sensations; we may shut our eyes, get out of the reach of perfumes, or close our ears. But as far as self-consciousness is concerned, the conditions of sensations being fulfilled, the conscious self cannot but be cognisant of the sensations which appear. And not only is the existence of sensations beyond the control of self, but also the grouping of sensations. The particular taste, smell, colour, and tangible quality which we designate by the name *orange* cannot, as far as consciousness is concerned, be made to undergo any change. There are natural combinations of sensations, not produced by subjective association, but evidently governed by some objective law, over which the conscious subject has no control. Thus, when we consider either individual sensations, or natural groups of sensations, as objects, we see that their objectivity arises not merely from being opposed to the subject in consciousness, but also from the laws of their existence. They are known as objects in contradistinction to the conscious subject; but their character as objects is not complete till they are considered as having laws of existence and mutual relations of their own, determined for them independently of any subjective association. Henceforth, when we speak of objects of consciousness, there will be implied the foreign* elements which we have now indicated.

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* It is possible that there are some sensations which cannot be revived except as parts of a group; and, perhaps, there are few which can be recalled by a merely mental effort without the aid of some associated circumstances. But nevertheless it seems allowable for us, as we have done in this section, to treat sensations as revived, excluding the conditions and accompanying circumstances by the helps of which they usually appear before consciousness.

† Sect. III. chap. i.

Relations of sensation-objects.

§ 33. We now come to a question of great importance in psychology, and about which there is great diversity of opinion. The objects of consciousness, the sensations and revived sensations variously grouped together according to their own laws, have an existence in *time*—they succeed one another. But their order in time is twofold; they may be successive, or they may be contemporaneous. Several objects may at the same time appear in consciousness; several sensations of different kinds may be experienced at the same moment. And the question is,—What is the relation in which these contemporaneous objects of consciousness stand to one another? The following are clearly distinguished answers to this question:—

Intuitive theory of extension.

(*a*.) The co-existence of sensations at the same point of time implies their mutual externality, and therefore involves the idea of extension or space. Several sensations, as of smell, taste, colour, sound, may exist altogether, and as they are distinguished from one another in kind, they must appear to be the one *without* the other. And this relation of mutual *outness* is the simplest form in which we perceive extension. According to this doctrine, extension or space is a *form* of our sensations as well as time, and equally original in reference to our knowledge. There is a slight modification, or perhaps an integral part of this theory, in which it is held that some single sensations, as colour and touch, occupy space, or are diffused over an extended space. Whether the one or the other, or both of these opinions be held, it is manifest that their holders look upon space as an original form of sensation, and perceived intuitively in the same way as time.*

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* Of course by *objects* here we do not mean anything *extra-organic;* but *sensations* as possessed of the *foreign-to-the-ego* character which we have described.

Objection constituting a general opposing theory.

(*b.*) In opposition to the above theory it is held that all mental phenomena are unextended, and that the possession of extension is the essential characteristic which distinguishes physical from mental objects. A sensation, therefore, as an object of consciousness, cannot possibly occupy extension or place. And since an individual sensation does not exist in space, it is impossible that the relation between two or more contemporaneous sensations can be a spatial relation. To speak of the mutual externality of sensations is, therefore, to attribute to sensations a mode of existence which they do not possess. Sensations differ in kind, and they succeed or co-exist with one another in time, and the attributing to them of any other relation would destroy their character as mental phenomena.

§ 34. Those who hold the second of the preceding views regarding sensation must in some way account for the origin of our conception of extension. Sensations, the primary object of consciousness, are not themselves extended, but we evidently possess a notion of extension which we must have got in some way. How has it been attained? The answers to this question divide themselves into two classes:—

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* For a full exposition and defence of this theory, see § 36.

A priori theory of extension.

(*a.*) Some maintain that extension is an original principle of our constitution which springs into consciousness upon the occasion of some sensation taking place. The sensation, although not itself extended, *suggests* extension by a law of our nature. Extension is thus an *à priori* but latent conception which rises up into consciousness upon the occasion of a certain experience, but is not the result of that experience. Now, it is evident that the placing of any conception amongst *à priori* principles simply amounts to a confession of inability to explain it otherwise. Inexplicability is an important characteristic of all conceptions believed to be *à priori.* But before admitting any notion to be inexplicable, we are in duty bound to examine any attempt which has been made to explain it. The following attempt is the most important.

Muscle-and-time-theory.

(*b.*) It is held by J. S. Mill and others that the notion of extension is the product of muscular sensations differing in intensity and duration. "Suppose," says Mr. Mill, "two small bodies, A and B, sufficiently near together to admit of their being touched simultaneously, one with the right hand, the other with the left, here are two tactual sensations which are simultaneous, just as a sensation of colour and one of odour might be; and this makes us cognise the two objects of touch as both existing at once. The question then is, What have we in our minds when we represent to ourselves the relation between these two objects, already known to be simultaneous, in the form of extension or intervening space—a relation which we do not suppose to exist between the colour and the odour? Our answer to this is, "That whatever the notion of extension may be, we *acquire* it by passing our hand or some other organ of touch in a longitudinal direction from A to B; that this process, as far as we are conscious of it, consists of a series of varied muscular sensations. . . . When we say that there is a space between A and B, we mean that some amount of these muscular sensations must intervene; and when we say that the space is greater or less, we mean that the series of sensation (amount of muscular effort being given) is longer or shorter. If another object, C, is farther off in the same line, we judge its distance to be greater, because to reach it, the series of muscular sensations must be further prolonged, or else there must be the increase of effort which corresponds to augmented velocity. Now this, which is unquestionably the mode in which we become *aware* of extension, is considered by the psychologists in question to *be* extension. The idea of extended body, they consider to be that of a variety of resisting points existing simultaneously, but which can be perceived by the same tactile organ only successively, at the end of a series of muscular sensations which constitutes their *distance*, and are said to be at different distances from one another because the series of intervening muscular sensations is longer in some cases than in others. . . . An intervening series of muscular sensations before the one object can be reached from the other, is the only peculiarity which (according to this theory) distinguishes simultaneity in space from the simultaneity which may exist between a taste and a colour, or a taste and a smell; and we have no reason for believing that space or extension in itself is anything different from that which we recognise it by."[*] Here then is an attempt to explain extension by one who does not think extension is involved either in single sensations or in the relations of different but simultaneous sensations. Let us examine the attempt:

Refuted.

1. It is assumed that extension is identical with that by which it is recognised or measured, that is, with a succession of muscular sensations occupying time.[†] But this is by no means to be admitted.

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[*] "Mill Ex." pp. 273–275.

[†] The Saturday Reviewer, commenting upon this sentence, says: "Such is not the assumption. We do not answer for Mill's expression of the theory at all points; but the substance of it is, not that extension is the same thing as muscular sensation, but that our notion of extension is an abstract mental symbol of possible muscular sensations, which is the result of innumerable muscular sensations that have taken place in the actual experience of ourselves or our ancestors."

We did not assert that Mill's theory was "that extension is the same thing as muscular sensation." The sentence commented upon makes extension identical with a *succession* of muscular sensations occupying time; and this is exactly Mr. Mill's explanation *in brief*. It is unfair to take a summarised statement of a theory as a subject of criticism when a more or less full and complete statement has been given; and we submit that the full statement is probably as accurate an account of Mr. Mill's theory as could be given within our limits. Of course, the conception of

The amount of force with which a ball is expelled from the mouth of a cannon is recognised and measured by its velocity, that is, by the number of feet which it traverses in a second of time. But no one ever maintains that force is identical with velocity. In the same way, although extension is measured by a succession of muscular sensations occupying time, to say that the former is identical with the latter is quite unwarranted.

2. Why is it that *muscular* sensations are chosen to fill up the intervening space between one point and another? *All* sensations are *ex hypothesi* equally destitute of extension. The two points, A and B, are recognised by two sensations, and must be assumed not as points in space, but as points in time, because the idea of space is not supposed to be known. Let, then, the point A be marked by a particular sensation, say of smell; a number of intervening sensations, muscular sensations, or any others differing in intensity and duration take place. Then another point of time, B, is reached, marked by

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extension, according to Mill, is an abstract mental symbol drawn from actual experiences of muscular sensations succeeding one another in time; and we presume that the careful student would gather as much from our statement. Where Mr. Mill teaches that the actual experiences are either *our own experiences*, or the experiences *of our ancestors*, we do not know and would be glad to be informed. Some of Mill's successors in the same line of psychological thought have been driven to feel the weakness of his theory of the origin of our conception of extension, and have imported ancestral experiences in order to help it out of the difficulty. It is illegitimate, however, for the critic to introduce this as an element in his criticism of our statement of Mill's theory, which we still maintain to be substantially correct.

another sensation. Thus, here we have two points, A and B, points in time, and recognised by two distinct sensations, separated from one another by a number of intervening sensations, say of sight, or hearing, or smell, differing in intensity and duration. Is the result of this an idea of extension or space? Certainly not. The mere statement of the problem substituting for "muscular sensations" any other kind of sensations is sufficient to show the absurdity of deducing the notion of extension from that of sensations succeeding one another in time.

3. The reason why muscular sensations are chosen to fill up the space between the points A and B, instead of sensations of smell, or taste, or colour, appears to be that the former kind of sensations is conjoined with *motion*, which *involves* extension, and the points A and B are tacitly assumed to be points in space. For let us eliminate carefully from the data all spatial elements, and see what follows. The sensations by which they are marked are at first supposed to be simultaneous. In this there is only time. But the idea of space is said to be acquired by passing the hand from A to B. Suppose the hand is at A. Here is a sensation in time. B as yet does not exist, because the existence of the point must not be assumed till the sensation indicating it has taken place. The hand leaves A; the point A ceases to exist, except in memory, because the sensation indicating it has ceased. The hand reaches B; a new sensation takes place, a new point in time has been reached. But where is A? In

memory. It is a point not now existing, except in past time. To speak, therefore, of two points of time existing simultaneously is altogether unmeaning. And Mr. Mill's explanation is quite unintelligible unless the points are tacitly assumed to exist in *space* and the muscular sensations to result in *motion*. Thus the very idea whose origin the theory professes to explain is quietly assumed at the beginning of the explanation.*

A priori theory rejected.

§ 35. The preceding theory of extension, called by Mr. Mill the psychological theory, being found untenable, we are driven back to a reconsideration of the view which makes the notion of extension an *à priori* principle of the mind. According to this theory, the mind possesses in its own structure, as it were, a notion of space, but not a conscious one, and upon a certain experience this notion becomes conscious and is projected upon the object of experience. Now, with reference to this view, we confess, in the first place, a strong prejudice against the explanation of a difficulty by some *latent* or *à priori* mental principle. It simply amounts to a confession that the difficulty cannot be explained, and moreover it assumes the existence of a mental principle beyond the sphere of consciousness, which is, in philosophy, a very questionable procedure. And still farther, our conception of extension is not that of a subjective principle, but rather of an objective condition of things. For these reasons we decline to accept the view in question, although probably there is a certain truth involved in it, and go back to a more careful consideration of the first answer to the question, "What is the relation in which these contemporaneous objects of consciousness stand to one another?" That answer was that "the co-existence of sensations at the same point of time implies their mutual externality; and therefore involves the presentation of extension."

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* We do not know that anything would be gained by considering sensations as possible of being repeated in serial order, and repeated as many times as we choose to fulfil the conditions of feeling the sensations. This would indeed give us *the idea of some permanent object*, independent of self, from which the possibility of the sensations arose. But we do not see how *repeated series of sensations*, succeeding one another in time, could give us any idea of extension which could not be obtained from a single series of such sensations.

Extension how first given.

§ 36. In considering this view it must be borne in mind that sensations are considered as *objects* of consciousness. They have been set over against the subject into the position of the non-ego; they have laws of existence and mutual relations of their own. They are found collected together in groups or arranged in series, the different members of the groups or series not being capable, by any voluntary efforts of ours, of being separated from the other members. Thus they are recognised as having an element of *foreignness-to-the-subject* in them. The grouping of these objectified sensations is infinitely varied. Sensations of touch, and sight, and hearing, and taste, and smell, and muscular effort, are all combined in wonderful variety; and by the combinations and variations of these sensations the infant mind, just beginning its experiences in a new world, becomes acquainted with its organic surroundings. The little hands take hold of a toy, the eyes look at it, the mouth tastes it, the ears hear its rattle; in a great variety of ways these sensations are combined and modified. In the course of infinitely varied experience these sensations become *localised* in the midst of fixed groups of actual or ideal sensations. A sensation is *localised* when it becomes, in experience, inseparably connected with a group of other sensations; as, for example, when the taste of sweetness, in the mouth of an infant, is found connected with the peculiar feeling of a long cylindrical stick of candy, with the colours that are seen in it, and with the muscular sensations concerned in carrying it to and from the mouth, and so on. All these sensations become inseparably grouped together, that is, they become localised in an object, partly organic and partly extra-organic. Now it is to be observed that these objectified sensations appear in consciousness not merely in successive order as a temporal series; several of them appear simultaneously in consciousness; they hold the same position in time, and they are also external in reference to one another. This externality is perceived immediately, an intuitive act of consciousness. We can be conscious of more than one object at the same moment of time, otherwise all comparison would be impossible. And in the early consciousness of objectified sensations several of them may be and are comprehended in

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the same act of consciousness. These sensations, simultaneously intuited, are not confounded with one another; they are clearly distinguished as being differenced the one from the other, as the one being *outside* of the other, and the one differing *in quality* from the other. And this mutual externality of objectified localised sensations, as perceived in consciousness, is the first and essential element of the perception of extension.

§ 37. The preceding paragraph is concerned with the question, How are the essential elements of extension given in consciousness? The answer to this question may be thus summarised:—First, sensations are objectified, set over against the knowing subject as being known; secondly, they are grouped together in a variety of combinations, and when any one sensation becomes inseparably connected with a particular group it is said to be localised in that group; thirdly, these groups of objectified and localised sensations may be either successive, in which case we perceive that they hold to one another a *temporal* relation; or they may be simultaneous and distinguished from one another by difference in quality, in which case we perceive that they hold to one another a *spatial* relation. The first of these relations, the temporal, is admitted by all psychologists to be given in an original intuition of consciousness; and we have here maintained that the second of these relations is given in the same way. It is to be understood of course that the process of *abstraction* must be employed before the *perceptions* of sensations succeeding one another and sensations being mutually external to one another become developed into the *conceptions* of time and space. With this inquiry we are not at present concerned. There are two other subjects of investigation intimately connected with our subject, which must likewise be set aside for the present.

The first of these has reference to the grouping and presentation of sensations in consciousness. How comes it that such and such sensations are presented in consciousness, that they are differenced from one another in such and such ways, that they are presented in such and such groups, that this appearing and disappearing depend upon such and such conditions? This subject of investigation would take us into a sphere beyond that of psychology proper, as it is concerned with the constitution, origin and laws of that most important element of the non-ego known as the organism.

The second has reference to our ability to perceive sensations as succeeding one another in time and co-existing in space. How is it that the knowing subject can be conscious of its objects as coming the one after the other or as existing side by side in mutual *withoutness?* That this ability of the conscious subject is an ability not derived from the infinitely varied groups of sensations which appear in and disappear from consciousness, we feel certain; that it implies a certain constitution and origin of the knowing subject different from the constitution and origin of the organism, we also believe. But the determination of the mental constitution which makes possible the perception of succession and externality and the conception of time and space is also beyond the sphere of psychology, and would lead us into the profound depths of metaphysics, which are not the subject of the present treatise.

We have now reached all the elements necessary to complete our knowledge of that nearest and most complex portion of the outer world, the organism. And it will be our endeavour, in the next section, to study that process of acquiring knowledge next in order, the perception of external objects.

SECTION V.

PERCEPTION.

Résumé.

§ 38. In our analysis of perception we saw that our knowledge of external things may be resolved into certain sensations of different kinds, supposed to be at a distance from us, and united together in objects. Perception thus consists of sensations projected into space, and united together in a permanent group, supposed to have an existence independent of the mind which perceives. In the synthetical construction of our knowledge we have already studied sensations as objects to consciousness, and learned what is involved in them. We have already attained the knowledge of extension as the form of the non-ego immediately presented to consciousness; and we have seen that this non-ego constitutes that complicated physical organism by means of which more remote objects are brought to our knowledge. We have now to trace the education of this complicated sense, the process by which it enables us to perceive distant objects and their qualities.

Sensation and quality.

§ 39. The sensations which chiefly make known to us the existence of objects outside of our bodies are doubtless that of touch and the muscular sensation. In the exercise of the muscles, portions of the body are brought into contact with some objects outside of them which excite sensations of touch and resist muscular effort. The sensations of touch and muscular effort appear to have one object, and the resistance which it offers reveals its externality to the physical organ and independence of it. Thus there is produced within us the belief of the existence of some object of touch without us; and as that object opposes a greater or less amount of resistance to muscular pressure, we think of it as having a *power* to resist pressure, that is as being hard and solid. Thus hardness is the correlative of muscular force, the sensation of muscular exertion projected outside of our bodies and attributed to some external objects. But that which, in the organism, was a sensation, when thought of as without, is called a quality. Sensation and quality are thought of as having a twofold relation; the one with reference to knowledge, the other with reference to existence. In the first reference, sensation is the sign which suggests to us the quality; in the second, the quality is thought of as the cause which produces the sensation. The muscular sensation is connected also with motion of the limbs of the body, and when this motion is combined with the tactual sensation there is made known to us the smoothness, roughness, or other superficial qualities of the bodies which we touch. And as a matter of course, the extension which we saw was involved in the diffusion or the mutual externality of localised sensations, accompanies those sensations when projected outside of us. And thus we think of the hard or soft, rough or smooth objects of touch as being extended and figured. Hence we see that touch and its closely connected muscular sensations are very important means of augmenting our knowledge, carrying us away beyond ourselves into surrounding space and revealing a world of wonderful objects. But as far as we have gone, these objects are known to us only as correlatives of our tactual and muscular sensations invested with extension. We must now bring into requisition another sense, and see how the revelations of sight are combined with those of touch.

Projection of colours.

§ 40. It must be borne in mind that the knowledge primarily given in sensations of sight has for its object only a certain organic condition, and the colour which we see is really within us. But it is equally certain that colours *appear* to be at a distance from us, and consequently must have undergone a process of projection out into space. And we are now to inquire how this process has taken

By association with touch.

place, or, in other words, how the eye has been educated. We have already seen that touch brings to our knowledge external resisting bodies; and we shall see that this sense is the great educator of the eye, teaching it to clothe those bodies with the colours which appear in consciousness through the medium of the eye. It has been laid down as a law, "That a sensation appears to us to be situated at the spot in which we are accustomed to meet with its usual cause or condition, and this spot is the one at which the explorations of touch are capable, by acting there, of checking or modifying the commenced sensation."* A coloured object, for example, is placed within easy reach of a child's hand. The colour is a sensation which the child has not yet learned to project beyond its own eyes. Its hand touches and partially covers the object; the sensation of colour is at the same moment interfered with and modified. Thus a sensation of touch, by repeated experiments of a similar kind, becomes intimately associated with sensations of colour. The principal organs of touch, the hands, are themselves objects of vision. By repeated and various combinations of tactual and visual sensations, the object of touch is believed to be the same as the object of sight. But the movements of the hands serve to measure distance, and as the visual sensations soon become inseparably associated with everything which the hands touch, these sensations are thus projected to a distance from the eye. The power of projection having been once acquired, the process by which it was acquired is forgotten, and the eye spontaneously and unconsciously refers subjective sensations of colour to external and distant objects. The estimation of particular distances is soon acquired, depending upon clearness or obscurity of colour, number of intervening objects, magnitude, and other circumstances which will readily occur to any one.

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* Taine "On Intelligence," p. 314.

Other sensations associated and projected.

§ 41. A connection between the object of touch and the object of hearing, and between the objects of hearing and the objects of sight, is formed by a process similar to that described in the last paragraph. Hearing and sight are the only two senses in which sensations are projected to any considerable distance, and as the acquired powers of both are obtained chiefly through the assistance of touch, there is an intimate connection between all the three. A sensation of sound having taken place, it is immediately transferred to a distance, and we attempt to conceive or perceive what the sounding object looks like. In other words we attempt to explain to our minds the object of hearing by translating it, as it were, into an object of sight. In the same way, a sensation of colour having taken place, we at once project it to a distance, greater or less according to circumstances, and then connect it with sensations of touch and muscular sensations, or think what it would *feel* like if we were within reach of it. Thus we explain and enlarge the knowledge communicated to us through one sense, by connecting it with or translating it into the idealised sensations of the other senses. And the objects of the material world around us, as far as our knowledge of them is concerned, consist of various sensations projected to a distance without us, and united together in such a way that when one of them occurs, the others are invariably believed to be possible. But this objective union is not of our creation; it is manifestly a condition of the non-ego which we become aware of by the process we have indicated, but which we did not produce and cannot change.

Extra-organic objects.

§ 42. We are now led to a more careful consideration of this distant non-ego. As far as our *knowledge* of it is concerned we have seen that it consists of sensations projected into space and combined variously into different unities called objects. These projected sensations we call qualities, and thus objects are composed of a number of qualities. But objects thus composed are manifestly the creation, to a great extent, of our own minds. The sensations are mental phenomena; the act of projection, and the combination of sensations of touch with those of sight, and others, are mental processes. The *foreignness* and *independence* of these objects to the mind are revealed only in the fact that the mind cannot create or annihilate its sensations at will, and that the laws of the combination of these sensations are evidently not mental laws, but laws of the non-ego. In the *objectiveness* of projected sensations and their laws there is believed to be involved the existence of some non-ego *independent of our knowledge*. A sensation—for example, a colour—is something of which we are conscious, and even after the process of projection has taken place, after the eye has been educated, and we perceive the colour as at a distance from us, it is still a thing known to us. But besides this colour *as known*, we think of some cause or power existing beyond or behind the projected sensation which, striking upon our eye, has produced the sensation. This cause or power cannot be a sensation; it is supposed to exist anterior to and independent of our sensation. It cannot be an object of knowledge, because it can be known only as a sensation; but *ex hypothesi*, it has an existence anterior to sensation. Thus, the non-ego appears to consist of two elements; an element which is known, and an element which is unknown, but supposed to exist. The known element, we have seen, consists simply of projected sensations; the unknown element is composed of something which, when brought into relation with our senses, helps to produce sensations. The term *quality* has unfortunately become ambiguous by being applied to both of these elements. When it is said that the quality of an object is one of its characters by which it is known to us, it is evidently a projected sensation, for all objects as known consist of such. When it is said that the quality of an object is that which produces a certain sensation in us, it is applied to something which, apart from the sensation, is unknown. The former of the two applications of the word *quality* appears to us the most natural, and by quality we shall,

Phenomenal and noumenal elements.

Quality ambiguous.

therefore, henceforth indicate those characteristics of objects which constitute our actual knowledge of them. There is, however, a still farther restriction to the term quality, or at least an important distinction between two kinds of qualities. The qualities of colour, smell, hardness, &c., are simply sensations of sight, smell, muscular effort, &c., ideally transferred or projected into external space. But the space into which these sensations are projected or which they occupy is not a sensation of any kind. Although in our knowledge it is inseparably connected with sensation, it is essentially different from sensation. To adopt scholastic distinctions, it is the *form* of which sensation is the *matter*, the *quantity* of which sensation is the *quality*. It is therefore perhaps improper to speak of extension, figure, and other forms of space as being *qualities* at all. They are rather the spatial relations of qualities, the objective form into which sensations, being projected, are known as qualities. This essential distinction between the form of sensation and sensation itself has given rise to the distinction between primary and secondary qualities, the former comprising different modes of space, and the latter qualities properly so called, that is, projected sensations. Taking quality in the latter, that is in its proper sense, there is another distinction, although not an essential one, which may be observed. The mode of operation of the different senses is somewhat different. In touch there is necessarily a contact between the external object and the organism; in sight, hearing,

Quality distinguished from form or quantity.

and smell, the necessity of similar contact is not so obvious. Consequently touch has been supposed by some to bring us into contact with objects as they really exist; other senses not. Hence the distinction of some qualities being supposed to be more essential to the idea of body than others, or of some being purely subjective while others are partly or wholly objective. Perhaps such distinctions have arisen also from the fact that in some of the senses—for example, sight and hearing—there is obviously a perception of distance, or a projection of the sensation, while in others, as smell, there is not so much or so clearly so. Whatever may have given rise to such distinctions, they are fallacious. All qualities properly so called are originally sensations and subjective. All sensations come to be objectified, and involve elements belonging to the non-ego. All sensations except purely organic ones are projected ideally beyond the organism and there known as qualities, while purely organic sensations, that is, sensations which are discovered not to depend upon extra-organic conditions, are not thought of as qualities at all. Consequently the only essential difference between *qualities* of objects arises from the difference between the *kinds* of sensations.* Other differences are either fallacious or accidental.

Noumenal non-ego.

§ 43. Having considered the constituent elements of objects as *known* to us, that is, as consisting of real or ideal sensations projected into space and forming there a unity, let us now give some attention to the supposed *unknown* non-ego. When we perceive a colour, we think of some unknown cause or power which, coming into contact with our eye, gives rise to the sensation. So every other quality of objects suggests to us the existence of something behind it and beyond it which, in relation to our organism, gives rise to different sensations. Whatever this is, it is and must be in itself unknown, because when it comes within the sphere of our knowledge it is already transformed into some sensation or other mode of consciousness, and when we attempt even to *conceive* it, it must be conceived under the form of some mode of consciousness. Let us, for clearness, call this unknown something x. There is then supposed to be an x corresponding to every different quality which we perceive. And we may ask, What is the relation between the x of one quality and that of another? Is the x of light, for example, or a particular colour, the same as the x of heat? Is the x of smell the same as the x of taste? Or is there only one x for all qualities, which coming into relation with our organism, gives rise to the different kinds of sensations of which we are conscious? These are some of the questions which may be proposed in connection with this subject, and we refer to them here chiefly for the purpose of setting them aside. They are not questions which it is the business of the psychologist to answer. In so far as they can be answered, they belong to the sphere of experimental physics or of metaphysics: in so far as they are insoluble, they should be left alone altogether. As far as psychology is concerned, we are confined to the analysis and synthesis of our conscious knowledge; and in perception the object of our knowledge in the *sensible* world, that is, the world revealed to us through our senses. Outside or behind this sensible world we cannot go, either in perception or in imagination.* The unknown x of sensible qualities is not only incapable of being perceived, but also as x of being conceived. As in psychology we are concerned only with what can be known, questions regarding the unknown are referred to only to point them out as irrelevant.

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* For another distinction, see § 199.

Proper meaning and object of perception.

§ 44. We are now in a position to understand clearly what we mean by the *object* of perception. From what we have seen, it is manifest that perception is the act only of *educated* senses. And those who identify perception with consciousness must mean by it something different from what is usually meant by the word. The object of perception must be at a greater or less distance from the sentient organism. Its existence is made manifest by a sensation of colour or some other. The sensation is, as we have seen, transferred outwards, in a particular direction and to some particular distance. We see the object. But sight gives us nothing but colour and figure; these qualities are, however, connected in our minds, in consequence of past experiences with other qualities. And if we have before seen the object, we are able to predict what other sensations it is capable of giving rise to. We can say how it will feel, smell, taste, &c., that is, we recognise the object, and give it a name. Thus perception implies at least one actual sensation, and several other ideal ones connected with it; implies also a belief that these ideal sensations will become actual if the necessary physical conditions are fulfilled. Now the sensible world, in perception, is separated from the mind, although in the analysis of the process of perception we have seen that this separation is not a real one. The sensible world is partly the creation of the conscious mind; and in the study of psychology it must ever be borne in mind that the objects of that world combine in themselves both subjective and objective elements, partake both of the ego and the non-ego. In the study of the particular sciences, however, such as optics, acoustics, mineralogy, botany, as well as in the ordinary affairs of life, it is quite legitimate, and, indeed, necessary, to bestow independent existence upon the objects of the senses. This is done for us naturally in the education which our senses receive. And the study of objective science does not require us to leave the standpoint of practical life while the study of psychology does.

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* We may, however, as we shall afterwards see, by inference. See §§ 198–200 and 207–9.

Note on the Process of Perception.

The process of perception described in the foregoing section is so important that, at the risk of

Elements of perception.

being charged with iteration, we subjoin a somewhat fuller description of it than the above. The crude phenomena which appear in consciousness are *Feelings* related to one another in point of *difference, resemblance, simultaneity, or succession.* The most primitive act of thought consists in the intuition of one of these relations. And next in rank is the synthetic act by which objects or elements thus related are connected together into unity. These primitive acts of thought, carried on involuntarily, result in certain products which constitute the simple objects of common knowledge; and we now propose to study these products. We consider first the perception of difference and simultaneity.

We have already seen that there can be no cognition of simultaneous objects without a perception of difference. That which enables the child to distinguish between colours, and sounds, and tastes and smells, is a certain difference in the manner in which his senses are affected. But along with this difference of sensation there is a co-existence of them. Sensations differing from one another in quality are frequently experienced in regularly combined groups. A connection is thus formed between them, so that when one of the sensations is experienced the others are expected. This combination of a real with expected sensations constitutes an object. The formation of natural objects is therefore one of the most primitive products of thought.

All objects of knowledge are composed of a certain uniform group of sensations and expected sensations; but it takes a considerable amount of experience to determine accurately the exact constituents of objects. A child, for example, has been accustomed to take some disagreeable medicine from a spoon; this experience has been repeated so frequently that a firm connection has been formed between the appearance of the spoon in the hand of the nurse and the disagreeable taste of the medicine. To the mind of the child, the hand of the nurse holding the spoon and the expected taste constitute an object; and the child's mistake is corrected only when some pleasant food is given to it by the spoon. Then it learns that the taste of the medicine is not an invariable element of that cluster of sensations introduced by the sight of the spoon.

Connection of the objects of sight and touch.

The most important of the sensations connected together in the formation of objects are those of sight and touch. The sense of sight gives only colours differing from one another in quality and occupying a certain bounded space. The sense of touch combined with the muscular sense of effort leads to the inference of hard or soft, rough or smooth, resisting bodies existing outside of us. The motion of our limbs in contact with external bodies gives us the idea of distance; but it takes a considerable time for the child to connect the figured colour which it sees with the resisting body which it touches. The same sensations of colour and the same sensations of touch and muscular effort having been frequently experienced together, the child learns to believe that the object which it sees is the same as the object which it touches. Other sensations, as of smell, taste, or sound, are soon added to the group, and thus is produced the full conception of a natural object.

Distance —how measured.

The distance of an object from the body is first measured by the motion of the hand towards it. The greater time and effort required to reach an object the farther it is believed to be away from us. But it is observed also that the greater time and effort taken by the hand to reach an object, the dimmer does the colour of the object appear to the eye; and the difference between clearness of colouring is still more observable when the process of *walking* is combined with the stretch of the arm. Other differences of appearance also are observed by the eye, as a greater or less size, a greater or less clearness in the appearance of the minute parts of objects and so on. These differences of appearance become gradually connected with the longer or shorter time and the greater or less effort required to reach objects with the hand, and thus we learn to *see the distance* of objects, or, properly speaking, to *infer* from visible appearances, what are the distances from us of the objects of touch. Hence we see that the perception of the objects of the external world is a combination of intuition and inference. We perceive intuitively actual sensations; we expect, by an involuntary inference, the other sensations of the group. We intuite sensations of muscular resistance; we infer some resisting external object. We intuite particular sensations of colour; we infer the distance to be passed over before particular sensations of touch can be reached.

Permanence of objects—how learned.

The products of thought just described are founded mainly but not exclusively upon the relations of difference and simultaneity; other products of a primitive kind are founded mainly but not exclusively upon the relations of resemblance and succession. The child is conscious of the same sensation or the same group of sensations at successive times; the regular recurrence of the group of sensations leads to a belief in the identity of the object. Thus our belief in the permanence and independence of natural objects is the result of seeing that a present group of sensations resembles a group of sensations which we remember to have experienced some time ago. This recognition of similarity between present experienced sensations and past represented sensations is of the greatest importance as it is the foundation of our belief not only in the permanence of objects but also in the permanence and identity of ourselves. We have in this also the only means we possess of comparing all kinds of relations as well as objects with one another. Past periods of time, figures and dimensions of space, forthputtings of energy, experiences of pleasure and pain, are recalled and compared with present experiences; and thus our lives are enriched by being able to bring together the past and the present.

When the present group of sensations does not *exactly* resemble the representation of a past group, we get the idea of sameness of kind but difference of individual object. The child at first is unable to distinguish between its mother and other ladies; but, soon differences are recognised and individuals distinguished. The ability to perceive minute differences in the midst of a general resemblance is necessary in order to enable us to distinguish one object from another; as the ability to assert with confidence the exact resemblance of a present object and a representation is necessary to enable us to *identify* an individual.

The uniform connection between succeeding events constitutes what we know of the causal relation. When a certain phenomenon is uniformly followed by another phenomenon, the two become so connected that when the one appears the other is expected. Uniformity of succession is thus an essential, though not the only essential element in the causal relation.

We thus see that the objects and relations of our common knowledge are produced by the exercise of involuntary and to a great extent unconscious thought. When we first waken up to conscious life we find ourselves in the midst of a world of objects regarding which we know a good deal. This primitive knowledge is the result, no doubt, of an almost unconscious process which has gone on during the dreaming sleep of infancy, as our bodies and minds were being gradually adapted to our surroundings.

CHAPTER III.

THEORIES OF PERCEPTION.

SECTION I.

GENERAL DESCRIPTION AND CLASSIFICATION.

Subject introduced.

§ 45. IN order to have a clear understanding of any theory of perception, it is necessary to compare it with and distinguish it from other theories from which it to a greater or less extent may differ. And in this chapter we purpose to bring together, for the purpose of comparison, the most important theories regarding this subject which have been held by philosophers. In the early history of philosophy, the different departments of study were not clearly distinguished from one another. In the writings of the Grecian philosophers, there were frequently collected together, in a confused manner, discussions on psychological, cosmological, theological, ethical and logical questions; and a greater or less confusion of subjects that ought to be separately examined may be found throughout the whole history of philosophy. It is natural that in the early stages of human knowledge there should be this confusion; but it is necessary to the progress of knowledge that this confusion should be cleared away. It is chiefly in modern times, and especially since the time of Descartes, that we find the original chaos of human knowledge becoming separated into clearly defined sciences. We shall therefore look for the theories of perception which we wish to examine only in the history of modern philosophy, from the time of Descartes, as in that period we are likely to find the clearest statements of the results of investigation into the nature of our knowledge of external things.

Before proceeding to examine any of the particular theories which have been held regarding perception, we purpose to take a general view of certain fundamental differences between these theories, by means of which we may arrange them into classes. The possibility of making a classification assumes, of course, a knowledge more or less complete of the things to be classified, and the reader must therefore take for granted the accuracy of our general descriptions until he is able to verify them by the study of the special theories to which they may be applied.

Two points of view.

§ 46. There are two distinct points of view from which the student of the process of perception may proceed in the examination of his knowledge. It is difficult to find any single unambiguous word which indicates these points of view respectively, and therefore, without in the meantime naming them, we shall proceed to describe them at length.

(1) From the first stand-point the psychologist regards the objects of the world of sense as having an existence independent of the mind, and the

phenomena of the mind as having an existence independent of material objects. The trees and stones and other objects which we know, and as we know them, exist away outside of us, and the mind which knows exists somewhere within the body; and these two things, the external material bodies and the mind, are totally different in nature and independent in existence. And the problem of psychology is to determine how it is that the mind knows the objects of the material world, and what amount of confidence is to be placed in this knowledge. This is what we might call the stand-point of practical common sense. The practical man, with his sensive organism completely matured and educated, sees objects in the world around him apparently existing independently of his mind; and when he becomes a philosopher his great question naturally is how these objects which are extended, figured, and distant can be perceived by his mind, which is an unextended spiritual substance. Thus there is assumed the existence of two worlds differing in nature and independent in existence, and then the question is asked how does the one come to know the other, how does mind know matter? For the sake of distinctness, and for want of a better name, we may call this the stand-point of *practical dualism.*

Practical dualism.

(2.) Those who adopt the second point of view assume nothing regarding the existence or nature of an external world, but analyse all their knowledge into its original elements as found in consciousness, and beginning with the simplest facts given in consciousness, seek to discover the manner in which the sphere of our knowledge and belief is gradually filled up. As a preliminary to the adoption of this method it is necessary that nearly all our naturally acquired beliefs regarding the existence and nature of objects of sense should, for the time, be given up. The object of the psychologist is to determine the origin and process of the acquisition of knowledge, and therefore it is not legitimate to assume anything regarding the existence and nature of the objects of knowledge until it is seen *how they have become objects.* From this, which we may call the *philosophical* point of view, the student works his way from within outwards, beginning with those facts of consciousness, which, as far as he can discover, are elementary, endeavouring to discover what they reveal of the non-ego, and how they are combined or modified, and in no case assuming anything which they do not give.

Philosophical standpoint.

One or other of these points of departure has been adopted and adhered to with greater or less consistency by nearly all modern philosophers. We shall not at present express any opinion as to their respective merits, but proceed to examine the theories of perception which may be classed under them respectively.

Origin of representationism.

§ 47. We have said that the problem which the psychologists who adopt the first method require to solve is to determine how two independently existing and heterogeneous substances can have communication, the one with the other. Given that there exists a mind, spiritual and unextended; that outside in space there exist material bodies possessing various qualities; how does the former come to know or believe in the latter? The answers to this question have been various, and at present we shall not attempt any exact classification of them, as, indeed, perhaps no classification could be made without in some way doing violence to the theories concerned. Generally speaking it has been held that mind can have no *immediate* knowledge of matter, and that knowledge can only be effected by the intermediation of some image or idea which either represents or suggests the external object. The fundamental principle which appears to underlie most of the theories of this kind is that the mind cannot directly know anything but its own ideas, and consequently these theories have been classed together under such names as *idealism*, *representative idealism*, *cosmothetic idealism*, &c. But it is to be borne in mind that injustice may easily be done to theories by forcing them into some particular classification because some common form of language is employed in them, without careful consideration of the real meaning of the language and of other essential principles which the theories conprehend.

Philosophical method.

§ 48. Amongst those who study the process of perception from the second, which we called the philosophical stand-point, there are important differences. They all begin by giving up the posi-

CHAP. III. SECT. I.

tion of practical dualism which is the result of the ordinary education of the organism through which everyone passes. They analyse the objects of the senses into materials given in consciousness, and endeavour to ascertain those facts of consciousness which are irreducible to others more simple. Taking up their position thus at the origin of knowledge, they work their way outwards, tracing the process by which knowledge is gradually acquired. The principal differences which exist between different theories of this class arise from the different views which are taken regarding the nature and significance of the facts revealed in consciousness. As in the previous class we hesitated to attempt giving a more minute classification of the theories contained in it for fear of doing injustice to some of them, so now it will be as well to postpone minuter description until we have examined the important theories which assume this stand-point. Our general division of theories of perception into two great classes has been instituted chiefly for the purpose of furnishing a sort of key to the understanding of the theories to be passed in review. We shall not examine all the theories of each class in immediate succession, but shall rather take them in the historical order of their appearance, being thus better able to perceive their relations to one another.

SECTION II.

DESCARTES.

Descartes' foundation.

§ 49. Descartes began his philosophising by resolving to doubt the truth of all propositions received at second-hand. He found himself able to doubt the existence of the world, of God, of his own body, of everything in short except doubt itself. But doubt is only a form of thought, and hence, according to Descartes, the act of thinking itself, as given in consciousness, was the one certain foundation of all knowledge. But the assertion of thinking involves the assertion of a thinking being; *cogito ergo sum.* Thinking, in its widest sense, is the essence of mind.

Proof of a Deity.

Having thus established a firm foundation on which to build the superstructure of his system, Descartes proceeded to prove the existence of God. According to him, "When the mind reviews the different ideas that are in it, it discovers what is by far the chief among them—that of a Being omniscient, all-powerful, and absolutely perfect; and it observes that in this idea there is contained not only possible and contingent existence, as in the ideas of all other things which it clearly perceives, but existence, absolutely necessary and eternal, ... so from its perceiving necessary and eternal existence to be comprised in the idea which it has of an all-perfect Being, it ought manifestly to conclude that this all-perfect Being exists."*

Psychology of perception.

We need not stop to criticise this demonstration of God's existence. To Descartes' mind it was satisfactory, and he employed his belief in God's existence and veracity as a part of his psychology of perception. He reasons thus: "It cannot be doubted that every perception we have comes to us from some object different from our mind; for it is not in our power to cause ourselves to experience one perception rather than another, the perception being entirely dependent on the object which affects our senses. It may, indeed, be matter of inquiry whether that object be God, or something different from God; but because we perceive, or rather, stimulated by sense, clearly and distinctly apprehend, certain matter extended in length, breadth, and thickness, the various parts of which have different figures and motions, and give rise to the sensations we have of colours, smells, pain, &c., God would, without question, deserve to be regarded as a deceiver, if he directly and of himself presented to our mind the idea of this extended matter, or merely caused it to be presented to us by some object which possessed neither extension, figure, nor motion. For we clearly conceive this matter as entirely distinct from God and from ourselves or our mind; and appear even clearly to discern that the idea of it is formed in us on occasion of objects existing out of our minds, to which it is in every respect similar. But since God cannot deceive us, for this is repugnant to His nature, as has been already remarked, we must unhesitatingly conclude that there exists a certain object, extended in length, breadth, and thickness, and possessing all those properties which we clearly apprehend to belong to what is extended. And this extended substance is what we call body or matter."*

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* "Principles," part i., xiv.

Systematic statement of Descartes' doctrines.

§ 50. From these extracts, and from other parts of his writings which need not be cited, we may draw out what appear to be the essential principles of Descartes' psychology.

(*a*). He begins his investigations by starting from what we have called the philosophical standpoint, assuming nothing but the existence of *thinking* as his foundation. Then from the nature of certain ideas which constitute his conscious thinking, he infers the existence of an all-perfect and veracious Being.

(*b*). Consciousness reveals to us also certain other ideas which are—(1) beyond our power to create or annihilate; (2) ideas of extended substance giving rise to certain sensations; and (3) occasioned by *objects* different from God and existing outside of our minds which they (the ideas) *represent*.

(*c*). These ideas being beyond our own power must be produced in us by God. But since we clearly apprehend the idea of extended substance, and since God would not deceive us, it follows that this extended substance must exist outside of us.

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* "Principles," part ii., i.

(*d*). As the essential quality of mind is *thinking*, so the essential quality of material objects is *extension;* other qualities, such as hardness, colour, &c., being variable, and therefore accidental.

Criticism.

§ 51. It is admitted that the point of departure of Descartes' psychology is the true one; and it is more than could be expected that his subsequent investigations as to the essential elements of our knowledge and belief should, at the beginning of the history of modern philosophy, be faultless. Consequently we find in the principles which he endeavoured to establish several weak points which afterwards produced evil results. To these we shall turn our attention.

(*a*). The demonstration which Descartes gives of the existence of God assumes that whatever we clearly and distinctly conceive to exist must therefore have an objective existence. The nature of our subjective concept of God is the datum from which is inferred His objective existence. We believe in God's existence, therefore, because we trust that our faculty of conception will not deceive us. We need not criticise this so-called demonstration, as that would be apart from our subject, but it will be necessary for us to remember that, with Descartes, the existence of God depends upon the fidelity with which his own conceptions of God correspond to the objective reality. And of fidelity, the only test which he is able to apply is the clearness and distinctness of the conceptions themselves.

(*b*). There is great confusion in Descartes' description of the ideas of material objects. From the fact that they are beyond his power to create or annihilate, he very rightly concludes that they belong in some way to the non-ego. But when he speaks of ideas of extended substance, confusion is apparent. The idea, if mental, must, according to Descartes' principles, be unextended; how then can it be "in every respect similar" to that which is extended? And again, when he speaks of ideas being occasioned by *objects* outside of us, he very evidently passes away from the philosophical standpoint to that of practical dualism. Objects are believed in only by inference from the ideas; and it is illegitimate *first* to assert the existence of objects as an inference from ideas, and *then* to shift one's ground and account for the existence of ideas by the presence of objects. It is equally illegitimate to affirm that the ideas represent or resemble the objects. In order to say that one thing resembles another we must have an independent knowledge of both, and then, having compared them, we can affirm their likeness or unlikeness. But *ex hypothesi* we have no independent knowledge of objects, no knowledge whatever of them except through their ideas. Hence we cannot assert that the one resembles the other.

(*c*). It is, according to Descartes, by the power of God that the idea of extended substance is produced in our minds, and since we have confidence in God's veracity, we believe that there is really extended substance without us. But the existence of God depends upon the clearness and distinctness of our ideas; our idea of extended substance is also clear and distinct. It is difficult, therefore, to see why the inference from the clearness and distinctness of one set of ideas should be made use of to *establish* the inference which may be drawn with equal certainty from the clearness and distinctness of another set of ideas. Still farther, it is an unwarranted assumption, that our ideas of material bodies are produced in our minds by the power of God. Of course, in one sense everything is done by the power of God; but, as Descartes makes use of the power of God in his psychology, he means by it some special interposition by which an extended substance may be represented to a mind which is unextended. The introduction of the power of God is, at best, an unphilosophical hypothesis for explaining what, to the mind of Descartes, was an otherwise inexplicable difficulty. We shall see that this feature of Cartesianism afterwards became still more prominent.

In consequence of Descartes' doctrine of divine interposition, it was unnecessary for him to endow matter with any active powers. And consequently he makes bare extension the one essential quality of material substance. As for other ideas, such as colour, hardness, taste, etc., they proceed from this extended substance, or rather result from the close and intimate union between the mind and extended substance. We do not at present criticise Descartes' doctrine that simple extension, instead of some dynamical principle, is the only essential quality of the objective world. We call attention to it now in consequence of the influence which it exerted upon subsequent speculation.

Malebranche.

§ 52. The most important of the followers of Descartes was Malebranche (1638–1715). The doctrine by which he is best known is only a further development of a principle belonging to Cartesianism. Mind and body are two absolutely distinct and heterogeneous entities, and it is absolutely impossible that there can be any *natural* connection between them. Consequently Descartes said that our ideas of material bodies must really be produced by God. In the researches of Malebranche, this feature of Cartesianism is brought out into still greater prominence. He teaches that we, as spirits, exist in a manner in God, who is the place of spirits, and, participating in His knowledge, "we see all things in God." As God is omniscient, the ideas of all things in the universe must be in His mind; and since we, as spirits, are also in Him, we perceive the divine ideas of material bodies. It is interesting and amusing to see what wonderful contrivances are invented to overcome the difficulty *assumed* to exist, that the mind, because unextended, cannot directly perceive extended body. And it is probable that most readers in modern times will regard the explanation as still more incomprehensible than the original difficulty to be explained. Waiving, therefore, any general criticism of the doctrine as unnecessary, we shall point out a certain characteristic of the *ideas* of Descartes and Malebranche which must be noticed.

Cartesian meaning of idea.

§ 53. Both of these philosophers use the word *idea* to indicate some object of thought which is distinct from the activity of the mind in perceiving or thinking it, and which appears to have attributed to it an independent existence. For example, Descartes says :* "Further, I cannot doubt but that there is in me a certain passive faculty of perception, that is, of *receiving and taking knowledge of the ideas* of sensible things; but this would be useless to me if there did not also exist in me, or in some other thing, another *active faculty capable of forming and producing those ideas.*" And he soon concludes that the active power of producing these ideas is in corporeal objects.

The cardinal doctrine of Malebranche's psychology is that ideas of material objects can be directly perceived only by the mind of God; but since we exist in Him, we participate in His knowledge and perceive His ideas. Thus, in Cartesianism the idea is a distinct entity, contained in some mind either Divine or human, and existing quite independently of the mental activity involved in the perception of it. But a careful analysis of consciousness might have led these philosophers to the conclusion that the distinction between the act of thinking and that which is thought, the act of perceiving and the percept, the act of conceiving and the concept, is only a logical one. Any conscious activity of the kind is on one side an

Criticism

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* Med. vi.

act, on the other side an object or idea; the act is the idea, the idea is the act, but viewed in another relation. The greatest confusion in psychology has risen from the use in different senses and for different purposes of the word idea. And it is necessary now either to banish the word altogether from use, or to employ it in a clearly defined meaning. In the meantime it should be noted that all mental phenomena are objects of consciousness, and cannot exist apart from the consciousness in which they are apprehended. And to speak of ideas as if they could pass from objects to the mind, or as if one mind could be conscious of the ideas of another, is either an abuse of language or the illegitimate attribution of independent existence to an abstraction. This error of Cartesianism long continued to cause confusion in psychology, but it is now long since it was perceived and abandoned.

That is God

Spinoza.

§ 54. The philosophy of Spinoza (1632–1677) was, in a sense, the result of Cartesianism. The chief differences between the doctrines of Spinoza and Descartes had reference not to the psychological process of knowledge, with which only we are now concerned, but to the nature of the *real existence* which underlies all phenomena. Descartes had postulated the existence of two substances, thought and extension, as the necessary constituents of mind and matter. But it appeared to Spinoza that thought and extension are both themselves *phenomena*, and cannot therefore be the *substances* in which other phenomena inhere.

Descartes' psychological analysis had discovered only those *attributes* which were found to be *essential* to the mind and material body respectively. But Spinoza thought that *all* attributes must have a substance in which they inhere. And rejecting the dualism which had hitherto prevailed, he asserted that thought and extension are attributes of *one* common substance which underlies them both. There is thus only one substance, self-existent, infinite and eternal; and that substance is God. The qualities, however, of mind and matter are *phenomenally* distinct, so that, as in Descartes, there can be no direct causal or cognitive relation between them. But both are phenomena of one substance; there is a correspondence between them. The thought corresponds to the thing; the idea to the object.

To enter into any detailed examination of Spinoza's pantheistic ontology would take us altogether aside from our subject. The only important correction which he made in the Cartesian psychology was the assertion that thought and extension, being only essential attributes, cannot be considered as substances.

We shall now leave Descartes and his followers for the present, and give our attention to the beginning of another philosophical movement in England.

SECTION III.

LOCKE.

Locke's principle.

§ 55. Locke, in his psychology, begins with the principle, that there is nothing in the mind except what comes into it from without: it is like a sheet of white paper upon which experience writes our ideas. The experience which gives us our ideas is of two kinds, sensation and reflection: by the former, we perceive the qualities of bodies; by the latter, the ideas we have derived from sense are variously modified, repeated, or combined. Our ideas are thus either simple or complex. "But it is not in the power of the most exalted wit, or enlarged understanding, by any quickness or variety of thought, to invent or frame one new simple idea in the mind not taken in by the ways before-mentioned; nor can any force of the understanding destroy those that are there."*

There are some ideas, such as those of colours or sounds, which gain admittance to the mind through one sense specially adapted for them. There are other ideas, such as of space or extension, which convey themselves into the mind by more senses than one; whatever the mind perceives in itself, or is the immediate object of perception, thought, or understanding, Locke calls idea; and the power to produce any idea in the mind he calls quality of the subject wherein that power is. Qualities are of two kinds: First, those which are utterly inseparable from the conception of body, such as solidity, extension, figure, &c.; and second, those which are nothing in the objects themselves, but powers to produce various sensations in us by their primary qualities. Bodies produce ideas in us; in the case of primary qualities, by impulse, and in the case of secondary qualities, by the operation of insensible particles on our senses. The ideas of primary qualities of bodies are resemblances of them, and their patterns do really exist in the bodies themselves; but the ideas produced in us by the secondary qualities, have no resemblance of them at all. Perception is the first and simplest idea we have from reflection upon sensations. Before perception can take place there must be some idea imprinted by sense upon the mind; but in perception the ideas of sensations are often changed by the judgment.

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* Essay, bk. ii., ch. ii., § 2.

Primary qualities.

Secondary qualities.

Locke's doctrines briefly stated.

§ 56. In the preceding paragraph we have given, pretty much in Locke's own language, the most important of his doctrines regarding perception. We shall now endeavour to present in more systematic form his solution of the chief psychological problems, pointing out those which he has not attempted.

(1.) He appears to assume that the mind is nothing but a capacity of receiving sensations or ideas from experience. In this he differs from Descartes, who cannot doubt the existence of his mind as a thinking being independent of everything material. The principle of Locke and his school is: *There is nothing in the intellect but what comes into it through sense;* by Leibnitz, a distinguished follower of Descartes and opponent of Locke, this principle is amended by the addition, *except intellect itself.*

(2.) The psychological problem which Locke attempts to solve is *not* how there arises in consciousness the knowledge of an extended non-ego, *but* how the sensive organism *assumed to exist* conveys to the mind ideas of more distant objects. Locke thus begins from the stand-point of practical dualism.

external world or object
knowledg

(3.) The mind knows the external world by means of ideas, some of which resemble the qualities which exist in bodies, while others do not. And in this reference Locke is guilty of the same error which we find amongst the Cartesians; the idea is evidently thought to be something different from the activity of the mind in thinking it; Locke's psychology may therefore be described as one of representative idealism of the crudest kind.

(4.) The primary qualities of bodies are the only *real* qualities which they possess. The secondary qualities are only *powers* to produce certain ideas, as of colour, sound, &c., in us, but these powers are possessed and exercised *by the primary qualities.*

Locke's principle contested by Leibnitz.

§ 57. With reference to the first position of Locke, that there is nothing in the mind except what comes into it through sense, we may remark that it has occasioned an important and long-continued controversy amongst philosophers. Leib-

Leibnitz

nitz, the ablest contemporary critic of Locke's philosophy, pointed out that there must be a mind possessing a certain structure or constitution in order to render experience possible. And although Locke may be correct in saying that there are no *innate ideas* anterior to experience, yet the nature of certain elements of our knowledge is such that they could not be derived simply from experience. There are certain propositions which are characterised by self-evidence and necessity, that is, the truth of which we perceive intuitively and cannot possibly deny. As an example of these propositions we may cite, "Things which are equal to the same thing are equal to one another." This proposition is an ultimate intuition; it cannot be *proved* by anything more simple; it cannot be denied, because its opposite is inconceivable. It is argued, therefore, by those who differ from Locke, that the *necessity* of such a proposition could not originate in experience since experience can only give what *is,* not what must be; and consequently that there must be something in the constitution of the mind which imparts the character of necessity to certain axiomatic propositions.

Locke assumes dualism.

§ 58. Locke sets out with the resolution to trace the *origin* of our knowledge, and supposes that the mind at the beginning is destitute of all ideas. The most simple ideas are introduced into the mind through *sense,* that is, through the organs of our *physical bodies.* And still further, the ingress of the idea through sense is accounted for by some impulse of the primary qualities of external bodies. Thus there is *assumed* the existence of organs of sense and external bodies, and the problem is to show how the latter, by means of the former, transmit ideas of themselves into the vacant mind. Now there can be no question that this position of Locke is the one which the majority of men naturally occupy. There is in children and savages a complete practical knowledge of objects around them and of their own bodies, although there is thorough ignorance of what is meant by such words as mind, or sensation, or consciousness. In the historical acquisition of knowledge, *objects* are *perceived* before *sensations* are known in *consciousness.* Mankind, without reflection or conscious thought, assumes the stand-point of crude or practical realism, and the great majority of men never leave it. But when one attempts to make a psychological analysis of his knowledge, it is not legitimate to assume objects as existing until it is shown how they become known.

Locke's theory of ideas.

§ 59. Notwithstanding the implied assumption of the existence of bodies, there is an attempt on the part of Locke to show how the mind knows external objects. This is by means of ideas which come into the mind through the senses. It is difficult frequently to say what Locke means by the word idea, on account of the many different senses in which he uses it, and the inextricable confusion with which different senses of the word are interchanged. There is, however, reason to believe that he was what has been since called a representative or hypothetical

CHAP. III. SECT. III.

realist; that he held ideas to be the only things immediately known; that from the mind's knowledge of ideas it *infers* the existence of external qualities; and that the ideas of primary qualities really resemble those qualities, which latter really constitute bodies as they exist. Without undertaking a criticism of some of these positions, which we shall see afterwards is done by others, we may at present point out an important paralogism. The design of the representative hypothesis is to explain how we come to know external objects. These objects then are assumed to be in themselves unknown; and their existence is inferred to account for the existence of the ideas which are immediately known. Thus the ideas *represent* the primary qualities of external objects to the mind. Now supposing ideas to exist, and supposing the inference to be admitted that they have some external cause, we may ask how can it be affirmed that the idea represents or resembles the inferred quality? In order to assert that one thing resembles or does not resemble another, it is necessary that there should be an independent knowledge of the two things—a comparison between them, and a recognition of their resemblance or non-resemblance. But in this case there can be, *ex hypothesi*, no independent knowledge of one of the terms of the comparison. The quality is known only as an inference from the idea, and hence nothing can be asserted as to its likeness or unlikeness to the idea. The fact is, psychological analysis, in Locke's time, was only in its infancy, and consequently in his writings there

CHAP. III.
SECT. III.

was very great confusion in various respects—a confusion which has been to a very great extent cleared away by subsequent writers.

Of secondary qualities.

§ 60. It is to be noticed that, according to Locke, it is the insensible particles of the primary qualities of bodies which produce in us the ideas of the secondary qualities. The meaning of this appears to be that the resisting substance of a body may become so small as not to excite any sensible tactual sensation, but that still it is capable of exciting sensations of sight, smell, or taste. Thus all ideas are produced by impulse from some extended material substance, but in the case of the primary qualities, the extension is perceived, and therefore the idea resembles the quality, whereas when the extension becomes so small as to be imperceptible, it then gives rise to smells, tastes, and other non-resembling ideas. If this be Locke's meaning, we naturally ask, how is it that secondary qualities do not exist in bodies? If they are simply primary qualities divided into particles so small as not to offer resistance to pressure, there appears no reason for saying that they have no objective existence at all. This is another instance of Locke's confusion. We must now see how Locke's principles were treated by his successors in psychological research.

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SECTION IV.

BERKELEY (1684–1753).

Berkeley's clearness.

§ 61. When we compare the subtlety and clearness of the mental analysis found in the writings of Bishop Berkeley with the confusion perceptible in Locke, we might fancy that we had advanced at least a century onwards in the history of thought. In Berkeley we have the first English philosopher who obtained a clear insight into the problems of the psychology of perception. And his solution of some of these problems has not been improved upon to the present day, except, perhaps, in the manner of expression. We shall endeavour to give, as briefly as possible, an outline of the psychological doctrines of which he is the author.

New theory of vision.

Berkeley's *Essay towards a New Theory of Vision* was his first published philosophical work, and may serve us here as an introduction to his system. In it we have Berkeley's departure from the crude dualism of practical life and his theory of the manner in which that dualism is established. The following are the positions which he takes and defends :

"(1.) Distance, or the fact of an interval between two points in the line of vision—in other words, externality in space, in itself invisible—is, in all cases in which we appear to see it, only suggested to our imagination by certain visible phenomena and visual sensations, which are its arbitrary signs.

"(2.) Magnitude, or the external space that objects occupy, is absolutely invisible; all that we can see is merely a greater or less quantity of colour, and our apparently visual perceptions of real magnitude are interpretations of the tactual meaning of colours and other sensations in the visual organ.

"(3.) The situation of objects, or their relation to one another in space, is invisible; all that we can see is variety in the relations of quantities of colour to one another, our supposed pure vision of actual locality being an interpretation of visual signs.

"(4.) There is no sensible object common to sight and touch; space or extension, which has the best claim to this character, and which is nominally the object of both, is specifically as well as numerically different in each, externality in space or distance being absolutely invisible, while size and situation as visible have nothing in common with size and situation as tangible.

"(5.) The explanation of the unity which we attribute to sensible things, as complements of visible and tangible qualities of one and the same substance, is contained in the theory that visible ideas and visual sensations, arbitrary signs in a Divine Language, are significant of distances and of the real sizes and situations of distant things; while the constant association in nature of the two worlds of vision and touch has so associated them in our thoughts, that visible and tangible extension are habitually regarded by us as specifically, and even numerically one.

"(6.) The proper object of geometry is the kind of Extension given in our tactual experience, and not the kind of Extension given in our visual experience, and neither real planes can be seen—real extension in all its phases being invisible, and colour in its modifications of quantity being the only proper object of sight, while colour being a pure sensation cannot exist extra-organically in space."*

Substance of theory.

§ 62. The substance of the *New Theory* may be thus expressed: The perception by sight of distance, magnitude, and direction, or of bodies as existing without us and being extended, is not an original but an acquired power. In sight we are conscious only of colour, but as this sensation and various tactual sensations are frequently experienced contemporaneously, we fancy the object of sight is identical with the object of touch. And since it is the tactual qualities of bodies in which we have the greatest practical interest, visible colour and extension soon, by association, become simply signs to call up the tactual qualities of bodies supposed to be more real. There are some points in connection with this *theory* which may offer matter for criticism hereafter, but in the meantime, we shall take a farther view of Berkeley's psychology by quoting from his "Principles of Human Knowledge," part i.:

Objects of knowledge.

(1.) "It is evident to anyone who takes a survey of the *objects* of human knowledge, that they are either ideas actually imprinted on the senses; or else such as are perceived by attending to the passions and operations of the mind; or lastly, ideas formed by help of memory and imagination—either compounding, dividing, or barely representing those originally perceived in the aforesaid ways. By sight, I have the ideas of light and colours, with their several degrees and variations. By touch, I perceive hard and soft, heat and cold, motion and resistance, and of all these more or less either as to quantity or degree. Smelling furnishes me with odours, the palate with tastes; and hearing conveys sounds to the mind in all their variety of tone and composition. And as several of these are observed to accompany each other, they come to be marked by one name. Thus, for example, a certain colour, taste, smell, figure, and consistence having been observed to go together, are accounted one distinct thing, signified by the name *apple*. . . .

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* Prof. Frazer's analysis in his edition of "Berkeley."

Knowing mind.

(2.) "But besides all that endless variety of ideas or objects of knowledge, there is likewise something which knows or perceives them, and exercises divers operations, as willing, imagining, remembering, about them. This perceiving, active being is what I call *mind*, *spirit*, *soul* or myself. By which words I do not denote any one of my ideas, but a thing entirely distinct from them, wherein they exist, or, which is the same thing, whereby they are perceived—for the existence of an idea consists in its being perceived.

Objects have mental existence only.

(3.) "That neither our thoughts, nor passions, nor ideas formed by the imagination, exist without the mind, is what everybody will allow. And to me it is no less evident that the various sensations or ideas imprinted on the sense, however blended or combined together (that is, whatever objects they compose), cannot exist otherwise than in a mind perceiving them. I think an intuitive knowledge may be obtained of this by anyone that shall attend to what is meant by the term *exist* when applied to sensible things. The table I write on I say exists, that is, I see and feel it; and if I were out of my study I should say it existed, meaning thereby that if I was in my study I might perceive it, or that some other spirit actually does perceive it. . . . .

No matter.

(7.) "From what has been said it is evident there is not any other substance than spirit, or that which perceives. . . . . For an idea to exist in an unperceiving thing is a manifest contradiction, for to have an idea is all one as to perceive; that, therefore, wherein colour, figure, &c., exist must perceive them, hence it is clear there can be no *unthinking* substance or *substratum* of those ideas.

(8.) "But, say you, though the ideas themselves do not exist without the mind, yet there may be things like them, whereof they are copies or resemblances, which things exist without the mind in an unthinking substance. I answer, an idea can be like nothing but an idea; a colour or figure can be like nothing but another colour or figure. . . . . Again I ask, whether those supposed original or external things, of which our ideas are the pictures or representations, be themselves perceivable or no? If they are, then they are ideas, and we have gained our point; but if you say they are not, I appeal to anyone whether it be sense to assert a colour is like something which is invisible; hard or soft, like something which is intangible; and so of the rest.

Distinction between qualities fallacious.

(9.) "Some there are who make a distinction betwixt *primary* and *secondary* qualities. By the former they mean extension, figure, motion, rest, solidity or impenetrability, and number; by the latter they denote all other sensible qualities, as colours, sounds, tastes, and so forth. The ideas we have of these we acknowledge not to be the resemblances of anything existing without the mind, or unperceived, but they will have our ideas of the primary qualities to be patterns or images of things which exist without the mind, in an unthinking substance which they call matter, therefore we are to understand an inert, senseless substance, in which extension, figure, and motion do actually subsist. But it is evident, from what we have already shown, that extension, figure, and motion are only ideas existing in the mind, and that an idea can be like nothing but another idea, and that consequently neither they nor their archetypes can exist in an unperceiving substance. Hence, it is plain that the very notion of what is called *matter* or *corporeal substance* involves a contradiction in it. . . .

Spirit the objective cause of ideas.

(10.) "We perceive a continual succession of ideas, some are anew excited, others are changed or totally disappear. There is therefore some cause of these ideas whereon they depend, and which produces and changes them. That this cause cannot be any quality or idea is clear. . . . . It must therefore be a substance; but it has been shown that there is no corporeal or material substance; it remains therefore the cause of ideas is an incorporeal active substance or spirit."

Criticism.

§ 63. We now proceed to point out some things in Berkeleyanism worthy of remark. And, in the first place, it must be admitted that Berkeley has not carried his psychological analysis quite far enough. When he says, "by sight we have ideas of colour, &c.," it is plain that he assumes the existence of our sensive organism. And although, according to his theory, the organism is composed, like all other objects, of ideas, yet its existence should not be assumed until it is shown how it is known.

There is another defect in Berkeley's analysis which must be admitted. He was not able to discover the error committed by Descartes and Locke before him of supposing ideas to be distinct entities contained in a mind. He did not reach the discovery that the mental object of consciousness is identical with the mental activity. And consequently there is a character of crudeness about his theory which would have been avoided had he taken a correct view of the relation between ideas and mind.

Berkeley a presentationist.

§ 64. Perhaps the greatest merit of Berkeley as a psychologist is his complete overthrow of the *representative* idealism found in Descartes and Locke. The real objects which constitute the world in which we live are ideas, that is, are objects known; the ideas which are immediately known are the real things which exist. The assumption of some unknown, unthinking *matter* as the cause of our ideas is unphilosophical and absurd. Ideas cannot represent or resemble anything but ideas; qualities as known can have no resemblance to matter unknown. The sensible objects which we know are not representatives of any more real matter underlying them; they are the very things which exist.

It cannot be objected to Berkeley's psychology that because he denies the existence of insensible matter he destroys the reality and permanence of things. He believes that the things which he sees and touches would exist whether *he* saw and touched them or not; that they have a permanent existence because they are always perceived, that is, they always exist in the Divine Mind. The problem is to account for the permanent objective existence of sensible things. Berkeley's predecessors did this by postulating insensible matter; Berkeley was successful in his destructive arguments against the representative idealism of his predecessors; whether he was equally successful in establishing his own position remains to be seen.

Berkeley's thought controlled by language.

§ 65. There is probably to be seen in Berkeley's reasoning an illustration of the tyranny of language over thought. He sets out with the assumption that everything we know is an idea; and the very word "idea" compels him to hold that it exists only in a mind; it is incongruous to think of ideas being anywhere but in a mind. And since unknown, insensible matter is seen by him to be inadequate and contradictory as an hypothesis to account for the permanence of sensible objects, he is driven by his original view of the identity of ideas and things to substitute for matter a mind in which ideas may be contained when his or some other finite mind does not perceive them. Had he commenced with a different view of the nature of ideas; had he seen them to be not distinct entities capable of existence in different minds, but identical with and inseparable from the mental activity of his own consciousness, he probably would have been led to a different conclusion.

Confusion in his use of idea.

We observe also that there is in Berkeley a trace of the confusion in the use of the word "idea" which pervaded Locke. Colours, smells, tastes, are ideas; so are extension, figure, motion. Now after a careful analysis, there can be nothing clearer than that the *sensation* of smell or colour is quite different from extension or any form of space. And to class both under the common name "idea" will almost certainly lead to error. It has led Berkeley to the conclusion that there is no *externality* of objects to his mind except in the mind of some other being. And objects generally have externality from finite minds by virtue of their being contained in the Infinite Mind. Now what is this but saying that the Infinite Mind is practically identical with space, in which all sensible objects are perceived? Thus Berkeley's most important conclusions, regarding the non-existence of insensible matter, regarding the existence of Infinite Mind, regarding the nature of externality, and others, sprang from an erroneous view regarding the *nature* of ideas, and an indiscriminate application of the word "idea" to things essentially different. But although in the expression, and perhaps also in the meaning, of his doctrines he is not free from error, it must always be admitted that in his hands psychology began to be characterised by that subtlety and clearness of analysis which are so difficult of attainment, and yet so essential to its taking a position worthy of its importance in the circle of the sciences.

SECTION V.

HUME (1711–1776).

§ 66. David Hume was the natural successor in philosophy of Locke and Berkeley, and he carried their principles to a logical conclusion. The same clearness and acuteness of analytic power which we observed in Berkeley are to be found in perhaps a still greater degree in Hume. The publication of his writings constituted a crisis in modern philosophy which led his successors to go back to the consideration of the premises from which modern philosophers started, in order that they might avoid his conclusions. We shall give in his own words his most important doctrines.

Hume's doctrines.

Impressions and ideas.

"All the perceptions of the human mind resolve themselves into two distinct kinds, which I shall call *impressions* and *ideas.* The difference betwixt these consists in the degrees of force and liveliness with which they strike upon the mind, and make their way into our thought and consciousness. These perceptions which enter with most force and violence, we may name *impressions;* and under this name, I comprehend all our sensations, passions, and emotions, as they make their first appearance in the soul. By *ideas* I mean the faint images of these in thinking and reasoning." *

Simple and complex perception.

"There is another division of our perceptions, which it will be convenient to observe, and which extends itself both to our impressions and ideas. This division is into *simple* and *complex.* Simple perceptions, or impressions and ideas, are such as admit of no distinction or separation. The complex are the contrary to these, and may be distinguished into parts. Though a particular colour, taste, and smell, are qualities all united together in this apple, it is easy to perceive they are not the same, but are at least distinguishable from each other." †

Character and relations of impressions and ideas.

"All our simple ideas in their first appearance are derived from simple impressions which are correspondent to them, and which they exactly represent." ‡

"Impressions may be divided into two kinds, those of *sensation* and those of *reflection*. The first kind arises on the soul originally from unknown causes. The second is derived, in a great measure, from our ideas, and that in the following order. An impression first strikes upon the senses and makes us perceive heat or cold, thirst or hunger, pleasure or pain, of some kind or other. Of this impression there is a copy taken by the mind, which remains after the impression ceases; and this we call an idea. This idea of pleasure or pain, when it returns upon the soul, produces the new impressions of desire and aversion, hope and fear, which may properly be called impressions of reflection, because derived from it. These again are copied by the memory and imagination and become ideas." *

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* Works, i., p. 15. † Ib. i., p. 16. ‡ Ib. i. p. 18.

Substance, what.

With reference to the *substratum* of bodies, Hume asks "whether the idea of *substance* be derived from the impressions of sensation or reflection? If it be conveyed to us by our senses, I ask which of them, and after what manner? If it be perceived by the eyes, it must be a colour; if by the ears, a sound; if by the palate a taste, and so of the other senses. But I believe some will assert that substance is neither a colour, a sound, nor a taste. The idea of substance must therefore be derived from an impression of reflection if it really exist. But the impressions of reflection resolve themselves into our passions and emotions, none of which can possibly represent a substance. We have, therefore, no idea of substance distinct from that of a collection of particular qualities, nor have we any other meaning when we either talk or reason concerning it. The idea of a substance, as well as that of a mode, is nothing but a collection of simple ideas, that are united by the imagination and have a particular name assigned them, by which we are able to recall, either to ourselves or others, that collection. But the difference betwixt these ideas consists in this, that the particular qualities which form a substance, are commonly referred to an unknown *something*, in which they are supposed to inhere; or at least supposed to be closely and inseparably connected by the relations of contiguity and causation."*

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* Works, i., p. 22.

Extension

"Upon opening my eyes and turning them to the surrounding objects, I perceive many visible bodies; and upon shutting them again, and considering the distance betwixt these bodies, I acquire the idea of extension. As every idea is derived from some impression which is exactly similar to it, the impressions similar to this idea of extension must either be some sensations derived from the sight, or some internal impressions arising from these sensations." It is not the latter, therefore it must be the former. "My senses convey to me only the impressions of coloured points, disposed in a certain manner. Hence we may conclude with certainty that the idea of extension is nothing but a copy of these coloured points and of the manner of their appearance."†

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* Works, i., p. 32.

† Ib. i., p. 53.

Thus Hume concludes that extension is an idea *abstracted* from particular impressions of sense, the peculiarities of colour, &c., being left out of view, and attention paid only to the disposition of points.

Time.

"As it is from the disposition of visible and tangible objects we receive the idea of space, so from the succession of ideas and impressions we form the idea of time; nor is it possible for time *alone* ever to make its appearance, or be taken notice of by the mind."*

Space.

"We have no idea of space or extension but when we regard it as an object of our sight or feeling. So the indivisible movements of time must be filled with some real object or existence, whose succession forms the duration, and makes it to be conceivable by the mind."†

Cause of phenomena inexplicable.

"As to those *impressions* which arise from the *senses*, their ultimate cause is, in my opinion, perfectly inexplicable by human reason, and it will always be impossible to decide with certainty, whether they arise immediately from the object, or are produced by the creative power of the mind, or are derived from the Author of our being." ‡

Objectivity explained.

"The opinion of the continued existence of body depends on the *coherence* and *constancy* of certain impressions." §

§ 67. Having given the important psychological doctrines of Hume in his own language, we now proceed to make such remarks upon them as seem

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[*] Works, i., p. 54. [†] Ib. i., p. 59. [‡] Ib. i., p. 113. [§] Ib. i., p. 246.

called for. But before doing so we shall arrange more systematically the doctrines to which we propose to refer.

Doctrines arranged.

X

(1.) All our simple ideas are copies of some impressions previously experienced. No idea, therefore, can be found in the mind which has not, more or less proximately, been copied from some impression.—Locke

(2.) There is no idea in the mind of *substance,* either corporeal or spiritual, except in so far as substance means a collection of qualities or of impressions and ideas. This doctrine follows immediately from the preceding, since *substance* is admitted to be neither a sensation nor the copy of a sensation.

(3.) Extension and duration, or space and time, are ideas *abstracted* from sensations. The idea of extension is a copy of the co-existent points of visible or tactual impressions. The idea of duration is a copy of the continuity of sensations. But as abstract ideas have no existence independent of the concrete impressions from which they are abstracted, it follows that space and time have no existence independently of extended or continuing impressions.

(4.) It is impossible to infer with certainty the cause of sensations. The metaphysical hypothesis of an insensible substance as the cause of sensations, has been shown to be contradictory. And it is likewise impossible to infer, with Berkeley, that the Divine Mind is that cause.

(5.) If it be asked how objects, that is, collections of impressions, appear to have a continued and independent existence, the only answer that can be given is, that the impressions composing them are seen to have a certain coherency and constancy of recurrence which leads the mind to attribute to them independent existence.

Criticism.

§ 68. The first of these principles held by Hume is only a re-statement in more definite form of what, long before, had been held by Locke. But in Hume's hands it became a powerful instrument of destruction. We have no ideas except those that are copies of some antecedent impressions.

Sceptical results.

But matter as a *substratum* is not given in any sensation; neither is mind as the *subject* of ideas; neither is causal efficiency, except merely that one impression or idea regularly precedes another; neither is God. Therefore *we have no idea* of matter, or mind, or cause, or God. This *ought* to be Hume's conclusion; but he actually concludes that we cannot *infer* the existence of these unknown things. This principle, drawing with it, as it did, such sceptical conclusions, was most important in stimulating Reid and Kant to inquire into its accuracy. We shall, therefore, leave the criticism of it to them, merely pointing it out now as the principle which, by its consequences, led to the greatest revolution in the history of philosophy.

Hume's doctrine of substance.

§ 69. We now consider one of Hume's sceptical conclusions. He holds that we have no idea of *substance* except as a collection of qualities or impressions; no idea of it as the unknown cause of our known sensations. He holds, also, that it is impossible to infer conclusively that our simple sensations are caused by the Divine Mind. But, at the same time, there is an admission that sensations must have an origin somehow and somewhere. Sensations, he says, "arise on the soul originally from unknown causes. An impression first strikes upon the senses and makes us perceive heat or cold," &c. There is here, consciously or unconsciously, an admission that there is something beyond, or behind our sensations, which we cannot indeed *know*, but the existence of which we cannot *deny*. Connected with the origin of our sense-knowledge—that is, connected with the real existence of things—there is, Hume admits, a problem to be solved, which, however, he thinks insoluble. "An impression strikes upon our senses." Take almost any one of these words, and you cannot understand its meaning without taking for granted that very *unknown* which Hume wished to banish. *Impression* implies some receptive thing upon which some other thing presses, so as to leave its mark. What is that other thing which makes the impression upon the senses? Hume cannot answer; but he cannot employ ordinary language, he cannot *invent* a language which does not imply that beyond the sphere of our immediately known sensations there is another sphere which we are bound to believe in but may not completely know. Hume started with the assumption that we have no ideas but what are copies of sensations, and the sceptical conclusions to which he was led are the *reductio ad absurdum* of his principle. His principle landed him in a conflict with beliefs of which he could not rid himself, and he certainly showed great fortitude in throwing overboard those beliefs for the sake of logical consistency. But it is questionable if he was really sincere in doing so, and there is some reason for supposing that his design was simply to show the absurd conclusions to which his predecessor's principles naturally led. This at least he did, and did it with remarkable effect.

Extension.

§ 70. Hume's view of the origin of the idea of extension must now be referred to. As he was not at liberty to admit any idea which was not a copy of a sensation, and as he could not deny that we have an idea of extension, he was bound to show that it was a copy of some sensation. He accordingly assumed that sensations or impressions, as he called them, were extended; then abstracted his mind from the *quality* of the sensation, as colour, &c.; then as the result of the abstraction appears the idea of pure extension. And as the idea is a copy of the sensation omitting the particular colour or tactual quality, it follows, of course, that the idea is extended. But as it is an *abstract* idea, it can have no existence apart from the concrete sensation from which it was abstracted. One would have supposed that the incongruity of making an *idea* a *copy* of an *extended* thing would have been sufficient to make Hume abandon his principle altogether. But no; with a pertinacity worthy of a better cause he determines that, come what will, he will adhere to his principle. His doctrines, that the idea of extension is a copy from a sensation, that space and time are abstractions from concrete experiences, will be criticised hereafter.*

General view of psychological problems.

§ 71. As the scepticism of Hume formed such an important crisis in the history of modern philosophy, and as it is the natural conclusion of all that went before, it may be as well to present in a brief form a view of the important problems which had hitherto occupied the attention of psychologists, and the ways in which their solution was attempted. The diagram on the next page is an attempt to illustrate, in a rough way, the problems which psychologists have set themselves to solve. Let the circle R, C, H, T, S, with I in the centre, represent the mind and its sensations; R, indicating resistance, C, colour, H, hardness, T, taste, S, smell. I indicates the ego or subject of consciousness.

The capital letters R, C, &c., indicate actual sensations, and, since they are felt in the body, E, E, the circumscribed circle, may represent the extension of the organism. The small circle to the left hand, r, c, h, t, s, indicates the mind in a state of reflection, and each of these letters stands for the representative or the idea of the sensation indicated by the corresponding capital. The circle to the right hand, having O in the centre, indicates the object, supposed to have independent existence, and consisting of the qualities $R_{,,}$, $C_{,,}$, &c., all comprehended in $E_{,,}$, $E_{,,}$, objective extension. The small circle at the extreme right may represent the unknown matter, consisting of unknown powers, $r_{,,}$ $c_{,,}$ &c., corresponding to the known qualities, $R_{,,}$ $C_{,,}$ &c., which constitute the object of perception.

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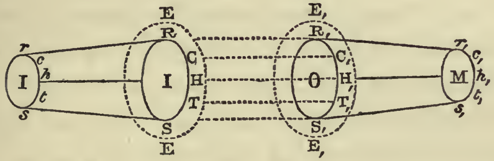
* See § 89.



Methods of studying them.

§ 72. Now, in examining the problems connected with the process of knowing and the objects of knowledge, there have been adopted, as we have pointed out, two methods. According to the first of these, the continuous and independent existence of the object O is assumed, and the problem is to explain the relation between O and I, between the extended object and the perceiving mind. And as it is also assumed that I and O are so utterly different in nature that the former cannot know the latter, it becomes necessary to interpose between them some intermediate and representative idea. Hence, the sensations R, C, H, &c., or the revived sensations r, c, h, &c., or some combinations of them, are thought to be representatives of the object O and its qualities. But after a more careful analysis, it comes to be seen that *some* of the qualities, such as $C_{,,}$ $H_{,,}$ $T_{,,}$ $S_{,,}$ are really identical with sensations C, H, T, S, and when this discovery is made, there must be a correction of

Representative theory.

Modified.

the representative theory. C, colour, is purely subjective, and so are H, T, S, therefore there are no qualities $C_{\prime\prime}$, $H_{\prime\prime}$, $T_{\prime\prime}$, $S_{\prime\prime}$, to be represented, nothing but certain unknown powers, $c_{\prime\prime}$, $h_{\prime\prime}$, $t_{\prime\prime}$, $s_{\prime\prime}$, consequently the sensations C, &c., which are immediately known, are made to represent these unknown powers. But here another difficulty presents itself. How can you say that something which is in itself utterly unknown is represented by something that you know? And, especially, how can you maintain that ideas of your mind are ideas of an unknown and unknowing matter? These are the questions that Berkeley asks, and by them overturns the representative theory. The sensations R, C, &c., are not representatives at all; they are the real things which exist. They are identical with $R_{\prime\prime}$, $C_{\prime\prime}$, &c., the distance and externality being only apparent not real. Scepticism regarding matter and space, begun in Berkeley, is continued and extended in Hume. All knowledge comes through sensation. But matter is not a sensation, neither is cause, neither is spirit, therefore these things do not exist. There are only the two series of sensations and ideas governed by certain laws. Thus, psychology, beginning with the assumption of practical dualism, is compelled to make use of a theory of representation to explain its difficulties, finds this theory unsatisfactory, and terminates in scepticism. As the representative theory played such an important part in psychology from Descartes to Hume, it may be serviceable to us to give some attention to the nature of representation and the

Overthrown.

use which has been properly or improperly made of it.

Different meanings of representation.

§ 73. Turning to the diagram in § 71 it is proper to say that c represents C; a revived sensation represents correctly and more or less vividly the original sensation of which it is a revival. But suppose an object of perception, say an orange, lies before us. A certain figured colour is seen, called by Locke and others an idea. This idea represents the object. Now this use of the word *represent* is utterly confusing and inaccurate. For what does it mean? It means that the sensation C represents $C_{,} + r + t + s$; or that the sensation of colour represents the quality of colour *plus* the other possible and imagined sensations of resistance, smell, taste, &c. which we believe we may experience from the orange. Now it may be quite correct to say that the sensation C calls up before consciousness by the power of association certain other revived sensations which have previously occurred in the same group with C; it is quite incorrect to say that C represents them. A third use of the principle of representation makes C represent $C_{,}$, the sensation represent the quality. But the truth is that the sensation *is* the quality as far as we know it. Sensations associated together and, by an organic process, projected into space *are* the objects *which we know.* It may be said, in the fourth place, that the sensation C represents the unknown power $c_{,}$, and this is quite as inaccurate a use of the word as any of the rest, as has been already shown. Thus in the first and only proper use of the word represent, it means both to stand for and resemble; in the second it means to be associated with so as to bring into consciousness; in the third it expresses the result of an organic illusion; and in the fourth it indicates an inference which we make regarding the cause of our sensations. The impropriety of regarding ideas as representatives in any of these senses except the first was clearly perceived by both Berkeley and Hume; and the errors of these philosophers, if such there are, must be looked for, therefore, in their views of the nature or origin of ideas. The former thought that all ideas, that is, objects of knowledge, must, as being ideas, exist in some mind; the latter maintained that all ideas are copies of some sense impression. Hence the idealism of the former and scepticism of the latter.

Ground of reaction.

§ 74. The conclusion of Berkeley and Hume may be regarded as the *reductio ad absurdum* of *representative* idealism as found in Descartes and Locke. But in these conclusions there was something unsatisfying to the human mind. People can scarcely bring themselves to think that the objects which they perceive have or involve no reality except the fact of their being perceived. Nor is it easy to think that space, or the externality of objects with reference to our minds, means simply the possibility of being perceived by another mind. It was therefore to be expected that there would be a reaction against the conclusions of Berkeley and Hume; and that that reaction would seek to establish—first, the permanent and independent existence of a non-ego other than a mental one; and second, the existence of ideas which are not merely copies of sensations. By the efforts of Reid and Kant this was attempted.

SECTION VI.

REID (1710–1796).

Reid shocked.

§ 75. Reid, like many other people of his time, was greatly shocked at the sceptical conclusions drawn by Berkeley and Hume, and he set himself with great ardour to refute the system from which he believed them to follow. The conclusions that there is no matter and no mind, that all the objects in the universe are nothing but floating impressions and ideas, were so utterly repugnant to his practical good sense, and so utterly repugnant to the ordinary beliefs of mankind in general, that he resolved to see whether some foundation for philosophy could not be laid upon which it would be possible to build more securely the structure of human knowledge and belief. To this task Reid brought a great deal of candour and honesty, a fair amount of learning, and a great deal of good sense.

But unfortunately he did not understand either Berkeley or Hume, and he was not at all clear as to what position he ought to take up in order successfully to refute them. He resolved to appeal from the philosophers to the common sense of mankind, which is a more or less satisfactory appeal according to what is meant to be included in the term common sense. Generally speaking, he appears to mean by it that practical good sense which leads men to trust to the testimony of their senses, and to believe in the existence of the world and a variety of other things. Sometimes, however, he gives it a more scientific meaning, and describes the principles of common sense as those beliefs which result from the constitution of our nature, and which are necessary and universal. Then taking his stand upon these principles, he thought that he was able to defy the most insidious attacks of the sceptic. Like the good knight, FitzJames, he addressed his foes, the idealistic philosophers :—

Reid militant.

"Come one, come all, this rock shall fly
From its firm base as soon as I."

But, unfortunately, it was not long before he went over to the camp of the enemy, cut his connection with his first friends, the men of common sense, and began to philosophise just as recklessly as any that had gone before him.

Reid versus ideas.

§ 76. We must now proceed to consider what it was that he accomplished or attempted in the interest of psychological science. And at the outset we observe with satisfaction that he noticed the improper use which his predecessors had made of the word "idea." He saw that there was no mental object numerically different from a mental activity; that the act of conceiving and the mental concept were really identical, being the same thing looked at from different sides. Consequently, when he speaks of ideas or any other mental objects, he considers them as equivalent to mental activities or states. He brought into prominence also the fact, which Berkeley had clearly pointed out before him, that the ideas or phenomena of the mind do not at all resemble the qualities which he believed to exist outside of him and to constitute the material world. There can be no resemblance between the sensation of colour and the objective quality which causes it; nor between the sensation of touch or pressure and the objective hard and extended body which occasions it. Thus thought Reid; and in establishing this position he believed that he had overthrown the idealistic hypothesis. If there are no ideas in existence except mental activities, and if these bear no resemblance to qualities of matter, how can there be any possibility of *reasoning* from those mental phenomena to either the existence or the non-existence of unknown material qualities? Thus Reid pronounced the *demonstration* of the existence of a material world, upon principles of idealism, to be impossible; equally impossible was the demonstration of its non-existence. And having thus shown the futility of the method of demonstration as applied to the problems of the psychology of perception, he took refuge in the instinctive beliefs of mankind from that scepticism in which he believed the principles of idealism terminated. Thus far we have considered Reid as a *destructive* thinker, overturning the false positions of his predecessors; we must now study his efforts towards the establishment of a true theory of perception.

Perception.

§ 77. "If," says Reid, "we attend to that act of our mind which we call the perception of an external object of sense, we shall find in it these three things:—First, some conception or notion of the object perceived; secondly, a strong and irresistible conviction and belief of its present existence; and thirdly, that this conviction and belief are immediate, and not the effect of reasoning."* And again, when examining the sense of touch, he finds that his *conception* of hardness is unlike any sensation and therefore not an idea of sensation; and also that the *belief* of the existence of hardness cannot be the result of any comparison of ideas or reasoning, he concludes thus:—"What shall we say, then, of this conception and this belief, which are so unaccountable and so untractable? I see nothing left but to conclude that, by an original principle of our constitution, a certain sensation of touch both suggests to the mind the conception of hardness and creates the belief of it: or in other words, that this sensation is a natural sign of hardness."† In speaking of colour, he says:—"The common language of mankind shows evidently that we ought to distinguish between the colour of a body, which is conceived to be a fixed and permanent quality in the body, and the appearance of that colour to the eye, which may be varied a thousand ways, by a variation of the light, of the medium, or of the eye itself. The permanent

Colour.

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* Hamilton's "Reid," i., p. 258. † Hamilton's "Reid," i., p. 121.

colour of the body is the cause which, by the mediation of various kinds or degrees of light and of various transparent bodies interposed, produces all this variety of appearances . . . . . The ideas of sight come to be associated with and readily to suggest things external and altogether unlike them. In particular, that idea which we have called the *appearance of colour,* suggests the conception and belief of some *unknown* quality in the body which occasions the idea, and it is to this quality, and not to the idea that we give the name of colour."* Reid's account of the perception of the *primary* qualities is substantially the same as of the secondary. An impression is made upon the retina of the eye, or a tactual sensation is felt in the hand; and these severally *suggest* visible and tangible figure and extension by some instinctive principle of our constitution which we cannot explain and cannot resist.

Primary qualities.

Doctrines arranged.

§ 78. Arranging the foregoing doctrines more systematically, the following appear to be the essential principles of his theory of perception:—

(1.) Qualities as they exist in bodies are, in themselves, absolutely unknown. This is true both of the secondary and primary qualities, since no sensation or idea of which we can be conscious has the slightest resemblance to either the one or the other.

(2.) The only objects which we can know are sensations or ideas, but these are not to be distinguished from the mental acts which they constitute.

(3.) These sensations or ideas are of various kinds;

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* Hamilton's "Reid," i., p. 137.

and, by an original principle of our constitution which we cannot explain, *suggest* the conception of some corresponding objective but in itself unknown quality, and create in us a belief of its existence. This suggestion of the conception and belief of the unknown quality is what Reid means by perception.

(4.) The suggestion, by the sensation, of the conception and belief of the quality, is *immediate,* that is, the mind passes from the sensation to the conception and belief of the quality without the medium of any process of *reasoning,* but by an instinctive and irresistible principle of our constitution. We have not been able to find in Reid a single passage in which *immediate* means anything but this.

Reid's departure from common belief.

§ 79. We can now point out the differences between Reid and his predecessors, and form an estimate of the value of his attempt to advance psychological science. We have already stated that he professed to adhere to the generally-received beliefs of mankind, but that he soon departed from the standpoint of men of common sense. The qualities of bodies are, according to him, unknown; the *appearance* of colour, for example, the phenomenal colour, is known to us, and suggests the existence of an unknown cause which exists permanently in bodies. But ask any ordinary man of common sense, and he will tell you that the colour *which he sees* exists in bodies. All men who are not philosophers believe that the greenness and the redness of which they become aware through sight really exists in bodies outside of them, and they do not know the meaning of a colour which cannot be seen. Reid tells them, "Oh no! my friends, your principles of common sense are generally correct, and what you cannot help but believe is generally true; but in this case there is a slight mistake. What you see, the blueness or the redness, is not the colour of bodies at all; it is nothing but an idea in your mind. The real colour of bodies is something that you cannot see; an unknown quality whose existence is suggested to you by that delusive appearance of colour which you incorrectly believe to be in bodies." There is reason to fear that Reid's friends of common sense would think his doctrine, that the colour of bodies is something invisible, rather paradoxical.

Philosophical language ambiguous.

§ 80. The principal differences between ordinary men, Reid, and the idealistic philosophers whom he opposes may be resolved into an ambiguity in the use of language. Turning again to the diagram in § 71, all men who are not philosophers look upon $C_{,}$ as the only colour which they know; they see it and believe it exists in bodies. Reid tells them that $C_{,}$ is really C, an idea, and that it is incorrect to call it a colour. The real colour is $c_{,}$, an unknown quality. Reid's opponents, the philosophers, agree with Reid in identifying $C_{,}$ with C, but they say that C is the colour and not $c_{,}$. Here is only a difference in the application of a name. But there are other differences of greater importance.

Suggestion of qualities necessary.

According to Reid, the sensations of which we become aware through the organism *necessarily* suggest external and otherwise unknown qualities, and, by the constitution of our nature, we *cannot but believe* in the existence of those qualities. To attempt, therefore, either to prove or to disprove their existence is absurd; they are given to us by a law of our nature more fundamental than any process of reasoning we might employ. And any system of philosophy which results in the subversion of this natural and necessary belief must be fallacious either in its original premises or in some of its intermediate processes.

Thus to the scepticism of Hume, Reid opposed his doctrine of the *necessary* suggestion and belief of objective qualities. What is necessarily believed cannot possibly be doubted; the existence of the qualities of bodies is, by a necessity of our nature, believed; therefore Hume's scepticism is impossible. Such was the reasoning of Reid; and if he could make out the alleged necessity, there can be no question but his reasoning was correct. But, unfortunately for his position, both Berkeley and Hume found it possible to doubt that which Reid pronounced to be necessary, and the possibility of an honest doubt is a clear disproof of an alleged necessity.

Extension not derived from sensation.

Another doctrine of Reid's, which he himself thought to be of great importance, was directed against one of the premises of idealism. Since the time of Locke it was an accepted maxim amongst English psychologists that all our ideas originate in sense. Upon the principle that there can be no idea which is not the copy of a sensation, Hume founded his sceptical conclusions. And Reid, therefore, saw the importance of endeavouring to show the falsity of this principle. He took the idea of extension as an *experimentum crucis;* showed that none of our sensations can be extended, while at the same time it cannot be denied that we have a knowledge of extension; and then triumphantly asked where this knowledge could come from. Since it could not possibly come through sense, no sensation being extended, the idealists, Reid thought, must find it utterly impossible to explain its origin upon their principles, while he himself had his instinctive beliefs to fall back upon. Extension is suggested, necessarily and inexplicably, by non-extended sensations, and it has an objective existence as a primary and essential quality of bodies.

These two points, the necessity of believing in the existence of objective qualities, and the origin of our knowledge of extension or space, are thought by Reid to be the most important parts of his philosophy. But perhaps if he and his opponents, the idealists, had understood one another better, there would not have appeared to be such great differences between them.

NOTE ON REID'S DOCTRINE OF PERCEPTION.

A distinguished modern psychologist, Sir W. Hamilton, has attempted to show that Reid held, in reference to perception, the doctrines of Natural Realism, which Hamilton himself professes

Is Reid a Natural Realist?

to hold, and which he regards as of first importance. In his twenty-third lecture of the Metaphysical Course Hamilton sums up his examination of Reid's doctrine by pointing out four suppositions upon which Reid must be held to be a Natural Realist. These are:—(1) If he maintain that his immediate perception of external things is convertible with their reality; (2) if he assert that, in his doctrine of perception, the external reality stands to the percipient mind face to face, in the same immediacy of relation which the idea holds in the representative theory of the philosophers; (3) if he declare the identity of his own opinion with the vulgar belief, as thus expounded by himself and the philosophers; or (4) if he declare that his perception affords us equal evidence of the existence of external phenomena, as his consciousness affords us of the existence of internal. And Hamilton adduces quotations, which we shall examine, to show that all these suppositions are fulfilled in Reid's doctrine. In support of the first and second, he adduces the following:—"We have before examined the reasons given by philosophers to prove that ideas, and not external objects, are the immediate objects of perception. We shall only here observe, that if external objects be perceived immediately we have the same reason to believe their existence as philosophers have to believe the existence of ideas, while they hold them to be the immediate objects of perception." ("Works," p. 446.)

From this quotation, according to Hamilton, we are to conclude that Reid holds that to be perceived means the same as to exist, and that, in perception, the external reality stands face to face to the percipient mind in the same immediacy of relation as the ideas of the philosophers stand to consciousness.

Immediate perception, what?

A fair reading of the quotation should lead us, we think, to this conclusion:—that the immediate perception of external objects is as sure a guarantee of their existence as the consciousness of ideas is of their existence. It is one thing to say that perception is a *guarantee* of existence or reality; it is another thing to say that perception is *convertible* with existence or reality. The latter was said by Berkeley, but Reid did not understand the doctrine and never expressed it. All that Reid meant to say was that we should place as implicit confidence in our perception of external objects as philosophers do in their consciousness of ideas. And none but madmen or fools have ever doubted this. But in saying this he asserts nothing whatever regarding the *character* of perception. He tells us, however, that external objects are the IMMEDIATE objects of perception, and here we appear to have something said regarding the nature of perception. But the question arises, What does Reid mean by *immediate?* There are two meanings of this term which it is of importance for us to discriminate. The first of these may be called the *psychological* meaning, and in this sense the term is used by Hamilton. In this sense immediate knowledge means *knowledge in which the object is present to consciousness itself and not through the medium of any representation.* The second of these may be called the *logical* meaning, and in this sense immediate knowledge means *knowledge which is obtained directly without the intervention of a process of proof or inference.* Now when Reid says that the objects of the external world are the *immediate* objects of perception, we cannot

Two meanings of immediate.

decide whether he is a Natural Realist, until we have determined whether he uses the term in its *psychological* or in its *logical* significance. He might use the term in its latter sense without having the most remote idea of the meaning of that immediate knowledge which is asserted in Natural Realism. A few quotations from his writings will show in what sense he uses it.

"In the meantime, I beg leave to think with the vulgar, that when I remember the smell of the tuberose, that very sensation which I had yesterday and which has now no more any existence, is the immediate object of my memory." ("Works," p. 106.) It is simply impossible that *immediate* can be used here in the *psychological* sense, since the so-called immediate object now no longer exists. And immediately below this passage he explains himself in such a way that we must conclude that he had the *logical* meaning of the word in his mind. "If you ask me," he says, "why I believe that the smell exists, I can give no other reason, nor shall ever be able to give any other than that I smell it. If you ask me why I believe that it existed yesterday, I can give no other reason but that I remember it." Manifestly *immediate,* of the first quotation, is identical in meaning with *I can give no other reason,* of the second. That is, it is used in its logical sense. Again, in his essays upon the Intellectual Powers, Reid says: "If, therefore, we attend to that act of our mind which we call the perception of an external object of sense, we shall find in it these three things:—*First,* some conception or notion of the object perceived; *Secondly,* a strong and irresistible conviction and belief of its present existence; and, *Thirdly,* that this conviction and belief are *immediate* and *not the effect of reasoning.*" ("Works," p. 258.) Here Reid himself indicates as clearly as possible that the term *immediate* is used in its *logical* sense. And in explaining the third of the above points he enlarges upon the fact that no process of reasoning is involved in perception. But throughout his writings we have nowhere been able to discover the idea of *psychological immediacy* which is involved in the doctrine of Natural Realism.

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Appeal to vulgar belief.

Hamilton's third point is that Reid declares the identity of his own opinion with the vulgar belief. What can be established by this it is difficult to see. Berkeley declared the identity of his opinion with the vulgar belief; and yet Reid is very far away from the position of Berkeley. Reid declared the identity of his opinion with the vulgar belief, and yet he maintained, contrary to vulgar belief, that *the appearance or idea of colour* is in the eye ("Works," p. 137) and that the *colour* of an external object is *something unseen and unknown* ("Works," p. 138). Hamilton declared the identity of his opinion with the vulgar belief, and yet he held that the immediate object of perception is in all cases in immediate contact with the organism, a proposition which the vulgar can neither understand nor believe. An appeal to uncritical, unenlightened, vulgar belief is surely unworthy of a philosopher.

Certainty of evidence.

In the fourth place, Hamilton tells us that if Reid "declare that his Perception affords us equal evidence of the existence of external phenomena, as his consciousness affords us of the existence of internal" he must be a Natural Realist. But surely it is possible to hold that we can place implicit confidence in the truth of perception without holding that the object of perception is immediately present to the mind. The essential point of natural realism is *that the non-ego is immediately present to and known by the ego;* but this point is not involved in the assertion that perception gives us *certain evidence* of its object. The longest train of mathematical reasoning gives us *certain evidence* of the truth of its conclusion, but this fact vouches nothing as to the *character* of the reasoning process. Neither does the certainty of perception vouch anything as to the character of perception. The fact is that Reid knew no more about the doctrine of natural realism than Berkeley knew about Kant's doctrine of the subjectivity of space. Although Berkeley came very close to the doctrine of natural realism, Reid did not even understand him, and it appears to be a foolish anachronism to attribute to Reid a doctrine which had then scarcely dawned upon the minds of psychologists.

Reid's doctrine of perception was a slight advance upon that of preceding representationists. He held *that sensations, by a natural and irresistible principle of our constitution, suggest to our minds the conception and create the belief of external objects, and that this suggestion is immediate and not the effect of reasoning. How* this can possibly be interpreted as a form of natural realism, and *why* the attempt should be made thus to interpret it, transcend the present writer's power of imagination to conceive.

We must now see how the scepticism of Hume was met by a German thinker far more profound than Reid—Immanuel Kant.

SECTION VII.

KANT (1724-1804).

Kant's Kritik.

§ 81. It was the negative scepticism of Hume which stimulated Kant to produce his great work, the "Kritik of the pure Reason." He saw, as Reid also did, that Locke's principle regarding the origin of knowledge naturally led to Hume's conclusion. If all our ideas are simply modified sensations, if all our knowledge arises out of experience, many of our most cherished and valuable beliefs must be undermined. Hence, Kant set himself to show that, although "all our knowledge *begins with* experience," yet "it by no means follows that all *arises out* of our experience." There are certain elements of our knowledge which could not be derived from experience. "Experience, no doubt, teaches us that this or that object is constituted in such and such a manner, but not that it could not possibly exist otherwise. Now, if we have a proposition which contains the idea of necessity in its very conception, it is a judgment *à priori*; if, moreover, it is not derived from any other proposition, unless from one equally involving the idea of necessity, it is absolutely *à priori*. An empirical judgment never exhibits strict and absolute, but only assumed and comparative universality."*

Origin of knowledge.

To show that there are such necessary and universal judgments Kant appeals to the sciences of mathematics and physics. We are not concerned with the general use which he makes of this distinction between the *à priori* and the empirical elements of knowledge; we have only to study its application to the psychology of perception. And in this we shall see a very important difference between the German and the Scottish opponent of Hume.

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* Kant's "Introduction."

Sensation.

§ 82. According to Kant, sensation is the result of objects affecting our sensibility or sensive faculties in a particular way. Thus, by means of sensation, we have an *intuition* of phenomenal objects. That in the phenomenon which corresponds to the sensation, Kant calls its *matter;* but that which effects that the content of the phenomenon can be arranged under certain relations, he calls its *form.* But that in which our sensations are merely arranged, and by which they are susceptible of assuming a certain form, cannot be itself sensation. It is, then, the matter of all phenomena that is given to us *à posteriori,* the form must be ready *à priori* for them in the mind. By an easy analysis, Kant reaches the conclusion, that the two forms of intuition, without which the cognition of phenomena would be impossible, are space and time. It is with the former that we are now concerned. The following are the principal elements of Kant's exposition of space:—

Matter and Form.

Space.

(1.) "Space is not a conception which has been derived from outward experiences. For in order that certain sensations may relate to something without me, and in order that I may represent them, not merely as without of, and near to each other, but also in separate places, the representation of space must already exist as a foundation.

(2.) "Space, then, is a necessary representation *à priori*, which serves for the foundation of all external intuitions.

(3.) "Space is no discursive, or as we say, general conception of the relations of things, but a pure intuition.

(4.) "Space does not represent any property of objects as *things-in-themselves*, nor does it represent them in their relations to each other.

(5.) "Space is nothing else than the form of all phenomena of the external sense, that is, the subjective condition of the sensibility under which alone external intuition is possible."

Summary of Kant's doctrine.

The substance of Kant's doctrine of perception is summed up by himself as follows:—

"All our intuition is nothing but the representation of phenomena; the things which we intuite are not in themselves the same as our representations of them in intuition, nor are their relations in themselves so constituted as they appear to us; and if we take away the subject, or even only the subjective constitution of our senses in general, then not only the nature and relations of objects in space and time, but even space and time themselves disappear; and these as phenomena cannot exist in themselves, but only in us. What may be the nature of objects considered as things-in-themselves, and without reference to the receptivity of our sensibility, is quite unknown to us. We know nothing more than our mode of perceiving them; and with this alone we have to do. Space and time are the pure forms thereof; sensation the matter. The former alone can we cognise *à priori*, that is, antecedent to all actual perception; and for this reason such cognition is called pure intuition. The latter is that in our cognition, which is called cognition *à posteriori*, that is, empirical intuition. The former appertain absolutely and necessarily to our sensibility, of whatsoever kind our sensations may be; the latter may be of very diversified character. Supposing that we should carry our empirical intuition even to the very highest degree of clearness, we should not thereby advance one step nearer to a knowledge of the constitution of objects as things-in-themselves." *

Criticism.

§ 83. One great merit which we must ascribe to Kant is the dismissal from his psychology of all accidental side questions, and the clear presentation of the fundamental problems which the psychologist endeavours to solve. The process of perception is reduced ultimately to a consciousness of sensations varied in character, but all agreeing in having, as a condition of their possibility, particular forms. Through these sensations there is made known the existence, although not the nature, of things-in-themselves.' The essential problems of every system of psychology must have reference to—(1) sensations, or what Kant calls the *matter* of sensations; (2) space and time, called the *form* of sensations; and (3) the thing-in-itself, or whatever it may be called, supposed to exist independently and as the cause of sensations. There is a fourth problem not so fundamental, regarding the process by which sensations form themselves or become transformed into distant objects of perception. Here we have presented in very small compass the subjects of all the disputed questions of psychology, and if psychologists only understood one another, the probability is that there would not appear so great a difference between their views as is now supposed.

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* These quotations from Kant's "Kritik" are from Mr. Meiklejohn's translation, published in Bohn's series.

Immediate objects of consciousness.

With regard to the first of these problems, the nature of the immediate objects of consciousness, Kant makes no distinction between the sensations and the mental acts which they constitute. But still they are mental, purely mental, and called by him representations of other and unknown objects of intuition. We shall have to notice in a subsequent philosopher an important difference regarding this question. The cardinal doctrine of Kant's psychology of perception is, however, the *à priori* and phenomenal character of space and time. Space and time are subjective in their origin, and are conditions only of phenomena, not of things-in-themselves. This problem also, we shall find,* gives rise to a great deal of discussion. An investigation into the nature of the so-called things-in-themselves is not properly a psychological one, although psychology has to do with the grounds of our belief in them. Kant considered them beyond the sphere

Space and Time.

Things-in-themselves.

of human knowledge, but Kant's German successors broke through the trammels which he had attempted to impose upon the human intellect, and speculated boldly regarding the nature of laws of what he pronounced unknown. Into these speculations it would be inconsistent with our subject to enter. But the psychological doctrines of Kant have been fruitful in stimulating and, to a certain extent, in guiding subsequent researches into the perennial problems of thought which he apprehended so clearly. Any criticism of Kant's doctrines we shall not now attempt, but leave it to be done by those of the present generation, to whom we must now devote some attention. Our historical review will, we trust, have produced two good effects: it will have enabled us to see the most important errors of the earlier psychologists; and will have given us a clear apprehension of what are the fundamental problems of the psychology of perception.

SECTION VIII.

MODERN ENGLISH PSYCHOLOGY.

Study of modern psychology.

§ 84. Was Kant successful in his refutation of Hume? By the principle which Kant endeavoured to establish, was philosophical scepticism rendered impossible or absurd? For an answer to these and similar questions we must look to the history of modern psychology. Hume and Kant are the representatives of the two great schools of modern English psychology, and it shall be our task in this closing section to refer, as briefly as possible, to the fundamental questions regarding which these schools are at issue. It would be impossible, within the space to which we propose to confine ourselves, to give anything like a fair account of even the most important of the psychological works of the present time; it would be equally impossible to do justice to the philosophical ability and learning with which the great problems of psychology have been treated. All that we propose to do is to introduce the student to a sphere of research of great interest and great extent, and to furnish, perhaps, some stimulus and some guidance in the pursuit of knowledge. We shall not, therefore, as heretofore, consider each psychological system by itself, but shall give an account of the manner in which psychological problems and difficulties have been treated by different writers. For the sake of brevity, we shall endeavour to avoid everything of secondary importance and of merely historical interest. We shall restrict ourselves to the consideration of the few essentially important problems which must be solved in one way or another by every psychological system; problems which have already been pointed out in connection with Kant. The attempt to ascertain or accurately to state what a philosopher really means is frequently attended with considerable difficulty; and we have prominent examples of the evils arising from a disingenuous or a prejudiced reading of the doctrines of another. This we shall endeavour to avoid, and give as briefly and accu-

Problems.

rately as possible the doctrines which we propose to discuss.

§ 85. Kant's general doctrine that there are certain *à priori* truths or principles which could not originate in experience may be better discussed at a future time. At present we are concerned chiefly with the modern doctrines concerning:—

(1) Sensations, or the immediate objects of consciousness; (2) space and time, especially the former; (3) the object and the process of perception; and (4) the believed objective cause which may account for the existence and permanence of the objects we perceive.

Objects of consciousness.

The question as to the nature of the immediate objects of consciousness is one of great importance. It has been almost universally held that the objects of which we are immediately conscious are ideas purely mental, either identical with the act of consciousness, or numerically, but not in nature, different from it. The names which have been given to these objects are various: sensations, impressions, ideas, representations, and so on. Whatever the name may be by which they are designated there has been a remarkable concurrence in considering the immediate objects of consciousness simply modifications or activities of the ego. Such is still the doctrine of those who adhere to the Berkeleyan idealism; such is the doctrine of nearly all the Association-school of psychologists represented by Hartley and the two Mills. In opposition to this view we have the doctrine to the establishment of which Sir W.

Hamilton devoted his learning and abilities, the doctrine that the immediate object of consciousness is not merely a mental product, but that it is the *non-ego.* There is frequently a great deal of difficulty in reconciling Hamilton with himself, and in getting a really intelligible view of his psychology. He frequently speaks as if distant and material things were objects of consciousness; and as if the impressions made upon our organs of sense were objects of perception.

But laying aside both of these erroneous and unguarded statements, and interpreting him in a fair and candid spirit, it appears to us that the essential point of his doctrine as distinguished from that which we have before referred to is as follows: In conscious knowledge there is an ego and a non-ego, a subject and an object known in contrast to one another. The object is an affection of the sensorium, a sensation of some kind, say of colour, resistance, or sound. But although a sensation, it *is* or *reveals* a veritable non-ego in immediate contrast with the ego. Conscious knowledge is in fact impossible which does not set over an object against the subject; and in relation to perception that which is thus objectified is a sensation. Thus sensations, although immediately known in consciousness, are not therefore purely mental; they contain a foreign element; they belong to or constitute the non-ego of our immediate knowledge.

Associational and intuitional schools.

§ 86. This difference of view regarding the nature of the immediate objects of consciousness is a funda-

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mental distinction between what we may call the Associational and the Intuitional schools of psychology. It must be accepted as a fixed principle of association that nothing can appear in the result of the process of association which was not involved in the original elements.* Now, according to most of the members of the associational school the original elements to be associated are sensations in certain relations. If these sensations are nothing but activities of the ego, if they are purely mental products, it is manifest that the objects into which these sensations are clustered and bound together by association can never become anything else but mental. If they are at the beginning, they must continue to be unto the end of the associational process, simply mental states or activities. And in the writings of the consistent association-psychologists, as Hume and J. S. Mill, we find that this is actually the case. Objects are clusters of sensations supposed to have a permanent existence independent of the individual mind, in consequence of their mutual coherence and regular recurrence. They are mental products objectified, and called by Mr. Mill Permanent Possibilities of Sensation. He has been censured for using such a negative term to indicate what other people think to be a collection of positive and non-mental powers. But the term is the very best he could have used. Beginning his associative process with purely mental elements, he could never reach to that which is non-mental. And if his psychology may be condemned because it does not recognise that which is essential in our knowledge of a material world, it cannot, at least, be condemned for its inconsistency.

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* That is, nothing different *in kind*. We have seen that association of sensations may give rise to new sensations, see § 25.

Intuitional standpoint.

§ 87. The other view, which we consider the correct one, regards sensations as being or involving subject *plus* object; there is in consciousness given an ego and a non-ego; there is something in the object of consciousness *other than* a merely mental state or activity. The full significance of this we shall not attempt to bring out at present. But in the meantime, we can see that there is not the same difficulty in attaining to a knowledge of a veritable objective world as in the former case. We can see that the association of elements already containing a true non-ego could easily and consistently lead to the ultimate result of the perceptive process, the knowledge of objects constituting a real world. We may now advance to the consideration of another fundamental difference between the two psychological schools. This difference has reference to the nature of our cognition of space or extension.

Extension, à priori theory.

§ 88. Kant, in order to withstand the scepticism of Hume, gave to space and time an *à priori* origin as the native *form* of our sense-intuition. The conceptions of space and time are not derived from experience, but they are the conditions by which experience is rendered possible. It is impossible to perceive any object or quality except in space, and this necessity at the very beginning of experience, it is alleged, could not be the result of experience. The necessity, however, is a subjective one; space and time have only a phenomenal reality; things in themselves do not exist under spatial and temporal conditions. Now, if by *à priori*, Kant meant only to oppose Hume's maxim that all our knowledge consists of impressions or sensations, and ideas, which are the copies of sensations, he appears to have succeeded. That which is at first a necessary condition of intuition cannot itself be the product of sense-experience. But the expression *à priori* appears to involve a view which modern psychologists are anxious to avoid. It appears to convey the idea that there is in the mind some hidden receptacle of unconscious forms or principles which are ready to start up into conscious life whenever the first incipient experience calls for them. This hidden limbo of *à priori* principles which cannot be examined by the light of consciousness is most convenient for those psychologists who think that it is a sufficient explanation of all their beliefs, whether simple or complex, which they cannot get rid of. But it appears at first sight unphilosophical to attempt to explain a difficulty by a mystery; to account for some necessity by *assuming* the antecedent existence of some form or principle in some hidden mental labyrinth beyond the ken of consciousness.

Extension the result of association or abstraction.

§ 89. Leaving for the present Kant's *à priori* explanation of space, we may examine the doctrines of more modern psychologists regarding it. These doctrines may be reduced to two. In the first place, it is maintained that the idea of space is the product of some process of abstraction or association exercised upon sensations; in the second place, it is held that space is given in intuition. With reference to the first of these doctrines we have already examined* one form of it as held by J. S. Mill, and seen the impossibility of the attempt to evolve space from time. And if we consider for a moment the nature of the processes of association and abstraction, we shall see that neither of them can account for the origin of our knowledge of space. Association unites together sensations or other objects of intuition into a compound; but the compound thus formed cannot possibly contain anything which was not in the original elements associated. Suppose that our only original intuitions are unextended sensations and the relation between them of succession or time, it will be impossible for any association to convert either sensations or time, or any combination of the two, into space. The most elaborate attempt to do so is that of Mr. Mill, and it, we have seen, is a failure. Equally impossible it is for the process of abstraction to *produce* anything not involved in the original objects of intuition, or in the perceived relation between them. Suppose that we are conscious of redness, greenness, blueness, and other particular sensations of colour. We are able to compare them, perceive their resemblances and differences, and form a general idea indicated by a general name, colour. Now in the result of this process there is nothing contained which was not given in the original intuitions; the result is just the summing up, as it were, of the original intuitions of particular sensations and their relations. In this case abstraction is employed for the purpose of generalisation, for the formation of a general idea or name. But space is not a general name; it is not predicable of any of the objects from which it is said to be produced by abstraction.* Nor is it in any way possible to know by abstraction *from* objects of consciousness what was *not* known by intuition *in* them. Those who maintain the contrary have yet to show its possibility.

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* § 34.

Extension, an intuition.

§ 90. The other modern view regarding the origin of our knowledge of space we have already expounded in Chapter II., and to that exposition now refer the reader. Extension, a form of space, is, we believe, given in an intuition; if not, we do not see how it can be known at all, as it certainly has hitherto proved incapable of resolution into anything else.

At the same time, although the essential element of extension is given in intuition, it must be admitted that abstraction has something to do with the elaboration of our notion of space. Abstraction must be made from the particular sensations or qualities which are given in intuition as extended, and there remains the extension without the quality, the form without the matter. But this abstraction manifestly does not *produce* our idea of extension, it simply disentangles it from the sensation or quality in which it is involved.

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* See Spencer, "Psy.," ii., 352.

With reference to the nature of space and time, there are many questions which have long exercised the minds of thinking men. Are they real things, having independent existence; or are they only attributes? Can we conceive empty space or time; or are they always connected with sensible qualities or objects? What is the nature of our conception of the whole of space and time; is it that of the infinite, or only of the indefinite? A reference to the modern doctrines regarding these and other questions would compel us to exceed our limits, and we must therefore refer the student who wishes to pursue his inquiries farther to the many able works upon these subjects which have been produced in recent times.*

Perception.

§ 91. We must now give some attention to modern doctrines regarding the object and the process of perception. And we remark at the outset that it seems desirable for psychologists, when adopting words that are in common use, to give them as nearly as possible the meaning sanctioned by ordinary usage. The word perception, when used by ordinary intelligent men, has a certain definite meaning and object; it means the knowledge which we have of objects at a distance from us, believed to have an independent and permanent existence, whether they are perceived or not by us or any other sentient being. But psychologists have concluded, and rightly, that this knowledge is a very complex product; they have analysed it into what they have believed to be its simplest elements; but instead of keeping the name perception to its proper object, the complex product, they have applied it to some of the more simple processes into which the complex has been analysed. And as it has not been applied uniformly, considerable confusion has been caused.

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* *e. g.*, Hodgson on "Space and Time."

We have next to refer to a false distinction between two opposing psychological schools. One school has been called the associational school, another the intuitive. The distinction is not an accurate one. All psychologists agree that the object of perception, as we understand and have just explained that object, is not intuitively known. All psychologists must assume at the beginning of the construction of their acquired knowledge certain objects which are intuitively known. All psychologists make some use of the principle of association in explaining the construction of their knowledge.

The only important differences which exist between psychologists have reference—(1) to the number and kind of the objects of intuitive knowledge; (2) to the extent of the use which may be made of the principle of association; and (3) to the question whether association can explain everything, or whether some other principle must be called in.

Mr. Mill's explanation of a material world.

§ 92. Mr. Mill, who is the representative of a large class of psychologists, past as well as present, assumes as the original contents of intuitive knowledge, certain sensations or states of consciousness, and the relations of co-existence and sequence existing between them. Upon these original intuitions he sets at work with his laws of association, and attempts to explain our belief of the external world. We have already seen with what success he has attempted to account for the origin of our idea of extension or space. We must now examine his attempt to explain our knowledge or belief of a permanent material world.

Beginning with the existence of sensations, he maintains* "that there are associations naturally, and even necessarily, generated by the order of our sensations and of our reminiscences of sensations, which, supposing no intuition of an external world to have existed in consciousness, would inevitably generate the belief, and would cause it to be regarded as an intuition." In support of this he shows that, in certain circumstances, sensations which we have felt recur to us regularly upon the fulfilment of certain conditions; that thus we think of the possibility of the recurrence of these sensations as being permanent, whereas sensations themselves are fugitive; that it is not merely single sensations, but groups of sensations, which are thus connected with permanent possibilities of them; and that the sensations of these groups occur in a certain fixed order. "Hence," he concludes, "we speedily learn to think of Nature as made up solely of these groups of possibilities, and the active force in Nature as manifested in the modification of some of these by others. The sensations, though the original foundation of the whole, come to be looked upon as a sort of accident depending on us, and the possibilities as much more real than the actual sensations, nay, as the very realities of which these are only the representations, appearances, or effects. When this state of mind has been arrived at, then, and from that time forward, we are never conscious of a present sensation without instantaneously referring it to some one of the groups of possibilities into which a sensation of that particular description enters; and if we do not yet know to what group to refer it, we at least feel an irresistible conviction that it must belong to some group or other, *i.e.*, that its presence proves the existence, here and now, of a great number and variety of possibilities of sensation, without which it would not have been. The whole set of sensations as possible, form a permanent background to any one or more of them that are, at a given moment, actual; and the possibilities are conceived as standing to the actual sensations in the relation of a cause to its effects, or of canvas to the figures painted on it, or of a root to the trunk, leaves, and flowers, or of a substratum to that which is spread over it, or, in transcendental language, of Matter to Form."* Here, then, we have the external world produced by Mr. Mill from sensations variously associated together.

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* "Examin.," p. 221.

Criticism.

§ 93. Now, let us pass over the question, how Mr. Mill gets his sensations projected into space, which he does not explain, and refer to another point of more vital importance. He speaks of "the active force in Nature," but we may ask how he comes to know anything about such a force? Force is not a sensation, nor is it any association of sensations. This, however, is not the main point of our criticism. "The whole set of sensations," he says, "as possible, form a permanent background to any one or more of them that are, at a given moment, actual; and the possibilities are conceived as standing to the actual sensations in the relation of a cause to its effects." Let us examine this statement.

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* "Examin.," p. 224–5.

The possibility of sensations is conceived as the cause of actual sensations. We have, for example, the sensation of a particular figured colour which is associated with the name orange. Connected with this sensation there are a number of possible sensations of smell, taste, touch, sound, &c. *The possibility of those sensations is the cause of the colour.* What does this mean? Is the possibility of a smell the cause of a colour? Is the possibility of a taste the cause of a colour? Or is the possibility of all the other sensations of the group taken together the cause of colour? If we ask a scientific man what is the cause of colour, he will answer that it is a ray of light. If we inquire farther what he means by a ray of light, he will tell us that it is the insensible vibration of an ethereal fluid caused by some power of a luminous body. This we can understand, but when Mr. Mill tells us that the possibility of a smell, or a taste, or a touch, or all put together, is the cause of a colour, we confess that we do not understand what he means. There appears to be such an utter incongruity between the antecedent and the consequent, that we cannot think of them as forming a sequence. And what is true of the sensation of colour, is equally true with reference to all our other sensations. The possibility, as Mr. Mill calls it, of one or more sensations of a group, we cannot think of as being the cause of the remaining different sensation or sensations. But yet this is the only kind of cause which could be reached from the original elements with which he sets out by the help of association. He begins with sensations; he ends with groups of actual and possible sensations having a fictitious objectivity.

Mr. Mill's method criticised.

§ 94. If, then, Mr. Mill's laws of association operating upon the original sensations of consciousness do not produce what we believe to be a veritable external world, we have now to inquire whether there is in his method any fundamental defect. The result of this inquiry will simply be an answer to the question formerly referred to,—Whether some other principle than the laws of association be not necessary to explain our belief in an external world? We believe that there is; and that the essential defect of the psychology of which Mr. Mill is an exponent, consists in the ignoring of this other principle. In that psychology it is assumed that sensations exist; but no attempt is made to account for their existence. Sensations exist in certain relations of co-existence and sequence; in some cases an invariable relation of antecedence and consequence is observed; and by association the antecedent comes to be looked upon as the cause of the consequent. And from this association or phenomenal theory of causation we are led to the absurd conclusion that the possibility of a sensation of resistance or smell is the cause of an actual sensation of colour. Now, it is perhaps in the simple original sensations of our consciousness that we are able to see most clearly the fallacy of the phenomenal view of causation which Mr. Mill accepts. When we have a sensation, say of smell, or colour, or taste, although they are most intimately and inseparably associated together, we never look upon the one as the cause of the other. And yet we do give an account to ourselves of the cause of these sensations. They are something beyond our own control; they come to us unbidden; and our very *powerlessness* with reference to them *compels* us to refer them to some objective *power*. That power is, as far as our consciousness is concerned, unknown; it is *not a phenomenon,* although it is manifested to us in a phenomenon. Thus our conception of a sensation as being a non-ego involves a belief of some veritable objective cause of it; and this intuition of the causal relation, whether strictly original or not, must be carried with us through the whole subsequent process by which our perceptive knowledge is built up. By the introduction of the causal judgment at this early stage we are able to account for the objectifying of our sensations; and we are able to account for a belief in material body in which will not be involved the absurdity of one sensation, or the possibility of one sensation being the cause of another of a different kind. According to this view, *phenomenal* body consists of objectified sensations collected together in a group by association; but to this body the educated intellect does not attribute any causal efficiency. On the other hand, *non-phenomenal* body or matter, as it is called, is simply a synthesis of inferred powers, each power being inferred to account for the sensation or quality corresponding to it which enters as a constituent member into the group of qualities which we perceive.

Inferred causes of phenomena.

§ 95. The statement of this latter view regarding the nature of the perceptive process in which the principle of causation is made use of in addition to the laws of association brings us to the last important point which we proposed to consider. The nature of the inferred causes of our sensations and their synthesis is a problem which the phenomenalism of Mill and his school does not touch. And yet it is with this problem that a great deal of modern science has to do. Light, heat, electricity, force, as studied by physicists, are non-phenomenal powers, and the object of science is to ascertain their laws and relations. With this subject we have nothing to do, except to point out that a true psychology must leave a place for it. The only place which Mr. Mill leaves for physical science is in that negative, utterly tantalising shadow of a thing which he calls the permanent possibility of sensations. Idealism postulates an intelligent power as the cause of the existence and objective synthesis of sensations; and to this there is perhaps no serious objection, except that the language which is used frequently leads ordinary people to suppose that something very absurd is meant. Realism, as found in Herbert Spencer and the Scottish school of philosophers, demands a belief in real objective non-phenomenal forces, capable of correlation with and transmutation into one another. Into a discussion of this we cannot enter; sufficient that we have pointed out its relation to the legitimate subjects of psychology.

We must now close our discussion of modern theories of perception, although aware of many important omissions and imperfections in our sketch. The necessity for brevity must be in part our apology for these. The student who wishes to pursue the subject farther will find valuable assistance in the works of Hamilton, Ferrier, Professor Grote, Bain, Mill, Spencer, Hodgson, Lewes and others.

CHAPTER IV.

REPRESENTATION.

SECTION I.

CONDITION OF REPRESENTATION.

Subject introduced.

§ 96. WE have already seen that in the process of the acquisition of presentative knowledge there is found mixed up with it a great deal of what is only representative. Our perception of any external object is a complex of presentative and representative elements, of actual and ideal sensations. Thus, in the acquisition of knowledge, there is involved the possibility of representing the elements of the knowledge already acquired. This power of representation is of great importance, apart altogether from its being subsidiary to the perceptive process, so that we must devote special attention to it. By far the greatest part of our knowledge can be brought before consciousness only in a represented state; and all the higher operations of the mind depend upon representation as a condition of their possibility. Before entering upon a consideration of the laws and kinds of representative knowledge, we must first give heed to the question,—How is representation possible? What are the conditions upon which the representing in consciousness of forgotten knowledge depends? Sensations, once felt, disappear from consciousness; knowledge once obtained, whether very simple or very complex, drops into oblivion. After a long time the sensation may be more or less vividly revived, the knowledge more or less completely restored. In the interval, it has been completely out of the sphere of consciousness. In its represented state, its original cause, the object of presentative knowledge is not present. The question is,—How is the knowledge revived without the assistance of its original object? How is the sensation repeated without the concurrence of its original external cause? As the objective cause of the recurrence of actual sensations in regular groups and order has been called the permanent possibility of sensations, so we might here speak, and with better reason, of the permanent possibility of phantasms or ideas as being the condition of represented knowledge. But the truth is that, in both cases, the permanent possibility is the very fact to be explained, and the mere statement of the fact is not the explanation of it. The general fact, then, which we know regarding this subject, is the permanent possibility of becoming conscious of phantasms or revived sensations.

Explanation hypothetical.

§ 97. The explanation of this fact is a problem of very considerable difficulty. There is no extra-organic object necessary to aid in the recall of forgotten knowledge. Sensations and perceptions, when forgotten, are altogether beyond the ken of consciousness. There are, therefore, no direct means of observing the condition of the possibility of their recall. Consequently, as far as psychology is concerned, the explanation must be hypothetical. The hypotheses which have been proposed in explanation of the problem are two in number. The condition of the permanent possibility of phantasms may be mental, or it may be organic; in the former case, we have the hypothesis of latent mental modification; in the latter, that of unconscious cerebration. To the respective claims and difficulties of these two conflicting hypotheses we may give some attention.

Two hypotheses.

Mental latency.

§ 98. The doctrine of latent mental modifications has been already referred to* as an attempt to analyse sensations into unconscious elements, and in that connection we saw reason to reject it. As an explanation of the permanent possibility of phantasms or ideas, it is open to some of the same objections as before. It postulates that the mind is capable of retaining within itself certain latent activities which are lying ready to spring up into conscious life whenever the occasion requires. But we have already noticed the objection against calling anything *mental* which cannot be observed by consciousness. If, however, we admitted the theory of idealism to be true, this objection would fall to the ground. That theory explains the *actual* sensations which are the elements of perception as the result of an objective *mental* cause. And consequently it would have no objection to explain the permanent possibility of *revived* sensations by a mental cause. But if we wish to retain the distinction between activities which are mental and powers which are not mental, and if we explain the latter as powers which originate and operate beyond the sphere of consciousness, we must reject the doctrine of mental latency. This distinction and explanation which characterise philosophical dualism as opposed to idealism appear to us to correspond to the truth of things, and therefore we must seek elsewhere for an explanation of the permanent possibility of phantasms and ideas.

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* § 26.

Cerebral hypothesis.

§ 99. The mental hypothesis being rejected, the only other possible hypothesis must refer us to some non-mental explanation of the difficulty; unless, indeed, we take refuge in some supernatural explanation of it, which, however, would in the present day scarcely be thought scientific. And as all realists or dualists admit a physical cause for their actual sensations, they can consistently offer no objections to the explanation of revived sensations by a non-mental cause. But as *ex hypothesi* there is no extra-organic object; the non-mental cause, if such there be, must be an organic one. The examination of this hypothesis is therefore transferred from the hands of the psychologist to those of the physiologist, and the latter presents us with his theory of unconscious cerebration.

In this hypothesis it is assumed that every sensation which has come into consciousness has been preceded and caused by some molecular movement in the substance of the brain; it is assumed that the repetition or continuance of a cerebral activity occasioned by continued attention to the conscious feeling of which it is the antecedent, will have the effect of making a permanent change upon the nervous tissue, and thus of *registering,* as it were, the original activity, so that it may be easily repeated. It is assumed, farther, that in the complex network of nervous centres which constitute the cerebrum, there is such a connection that any activity propagates itself from one centre to another, and to many others, and that this cerebral activity may either excite conscious sensations or not, according to circumstances. Here, then, we have all the essential elements of the hypothesis. There are, in the nervous tissue of the cerebrum, permanent registrations of forgotten feelings; permanent nerve-cells or clusters of cells produced or modified by some past activity; and these explain the permanent possibility of forgotten sensations being revived. Into the details of the hypothesis we cannot at present enter, but offer the following remarks regarding its difficulties and advantages.*

Difficulties

§ 100. There is no possibility of observing directly the correspondence between conscious sensations and nervous activity. Neither is there any possibility of observing any changes which may take place in the nervous tissues of the cerebrum; and if there were, it could not be said that these changes are the result of sentient activity. The evidence upon which the hypothesis is built is of a very indirect and obscure kind, consisting of facts observed by the vivisection of inferior animals, facts connected with diseased conditions of the human brain, and a variety of facts connected with peculiarities of memory and imagination. Thus the hypothesis is connected with many difficulties and obscure problems which cannot as yet be said to be finally solved. These difficulties, however, should not lead to the rejection of the hypothesis. The law of gravitation, which is now so universally accepted, was originally only an hypothesis founded upon very indirect evidence, and relating to bodies apparently so remotely connected with one another, that a man of ordinary intelligence in the days of Newton would probably have thought it absurd. Nearly all the great laws of the operation of physical forces have been slowly and laboriously established by the skilful guesses of men of genius being applied to the explanation of observed facts. The impossibility of directly observing unconscious cerebration, or cerebration of any kind, therefore, ought not to be conclusive against the acceptance of the hypothesis; and yet more, if this hypothesis be entertained, there is room for further discovery, whereas in the mental hypothesis there is none. What is beyond the reach of consciousness the psychologist, as such, can never examine. But the method and the skill of the physiologist are likely to improve as time goes on; and consequently we may hope that much additional

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* Those who wish to pursue the subject further are referred to the writings of Herbert Spencer, Dr. W. B. Carpenter, and Prof. Bain.

Should not cause rejection of hypothesis.

light may in future be thrown upon the obscure problems concerning the conditions of mental activity. In the meantime we have nothing more than an hypothesis; but no psychologist who is uninfluenced by prejudice will deprecate the time when the hypothesis may be recognised as an established law.

SECTION II.

LAWS OF REPRESENTATION.

§ 101. Everyone is familiar with that condition of mind which we call *reverie*. In moments of quiet repose, when there is nothing to agitate or disturb us, there appear before consciousness numberless and varied images of sights and sounds, of persons and things, of places and periods of life, of feelings and thoughts, of events long since past, of possible events still to come. These phantasms come and go apparently altogether independent of any effort on our part—they are *spontaneous*. But at other times when we have some object to accomplish, something to call forth our activity, we are able to control the representations of the fancy, to banish certain phantasms from consciousness and to call up others, to give attention to some and to disregard others. In this case the representation of phantasms is under the control of our will—it is *voluntary*. Now, in the study of the spontaneous and voluntary representations of the mind, the first problem which presents itself to the psychologist is to determine the laws

Meaning of laws.

according to which phantasms either spontaneously appear or, by an effort of will, are made to appear before consciousness. And here it must be observed that there is liability of confusion from not adhering closely to the problem to be solved. The word *law* should here indicate a general statement of the *order* or *relations* observed amongst the facts given; whereas it has been taken to mean an exposition of the nature or mode of operation of the cause by which the facts are supposed to be produced. Adopting the former sense, we proceed to state the laws of representation which have been formulated by psychologists under the name of laws of association.

Laws stated,

§ 102. The special laws of association which have been laid down are usually stated to be seven in number: *co-existence or consecution in time; contiguity in space; dependence as cause and effect, means and end, whole and part; resemblance or contrast; produced by the same power, or conversant about the same object; signified and signifying; designated by the same sound.*

Illustrations of the connection between ideas thus related to one another will readily occur to every one, but the following may be taken as examples:—

Illustrated,

In perception those sensations which are usually felt together or in immediate succession have a bond of association formed between them. Hence, an actual sensation which has previously been felt at the same time as a number of other actual sensations, when it is again experienced, brings along with it the phantasms or ideas of the other possible sensations

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of the group. So in more complex experience, persons and places and events which have been once conjoined together in our knowledge are always likely to be thought of together at subsequent times.

From the process of perception also many illustrations of the influence of contiguity in space in forming associated groups might be drawn. In truth, co-existence in time and contiguity in space are usually combined together; those objects which we have known at the same time have usually been close together in space, and both might be combined under one relation, that of contiguity in general.

In the next law, that of *dependence*, as of an effect upon its cause, an end upon its means, we have also a kind of contiguity. If we take the phenomenal view of causation, considering the cause of one phenomenon to be an immediately preceding phenomenon, this law may be completely reduced to the preceding one of contiguity in time and place. We say, for example, that fire is the cause of heat. If this means that the bright-coloured flame which we *see* is the cause of the sensation of heat which we *feel*, there is in the relation nothing but contiguity. But if it means that there is some real objective force which is at once the cause of the flame which we see and of the heat which we feel, there is something more in the connection between a coloured flame and a feeling of heat than mere contiguity in time and place. Thus the possibility of reducing the causal relation to one of contiguity depends upon the view of the nature of the causal relation

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which we take. If it is only a relation between phenomena, it is nothing but a special form of the law of contiguity in which an antecedent phenomenon called a cause is joined in our thoughts with a consequent phenomenon called an effect. If it is a relation *believed* to exist between that which is a phenomenon and that which is not a phenomenon, although the former is always associated with the latter, the connection of the two in thought exists, not because of frequent experience, but because of being given in an original or very primitive inference. As this latter is the view which we have maintained,* we cannot reduce the causal relation to that of contiguity.

The relations of similarity and contrast have a very powerful effect in recalling previous objects of intuition to the mind. A single sensation of any kind leads us to think of any similar sensation of the same sense which we have previously experienced. So a whole complex of sensations which we have formed into an object leads us to think of other similar objects. Illustrations of this are so numerous and familiar that we need not specify. So when similarity is made conspicuous by its absence, that is, when objects are strikingly in contrast with one another, the one has a strong tendency to recall the other.

The other relations, of things produced by the same power or conversant about the same object, of signified and signifying, of things designated by the same sound, are so obviously reducible to one or other of the preceding that we need not give to them special attention. In addition to those which have been mentioned there are many other special relations which may form a ground of association; but probably there are none which might not be reduced to one or other of the three important relations to which we have referred—those of contiguity, causation, and similarity.

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* See § 94.

Reduced to more general laws.

§ 103. Various attempts have been made by philosophers to reduce those special relations which form the basis of association into more general laws. Prof. Bain reduces them to two, the Laws of Contiguity and Similarity, Hamilton and others to the Laws of Simultaneity and Affinity. A still higher generalisation reduces these all to one, that of Redintegration, first enounced by Augustine, and afterwards adopted by many subsequent philosophers. It is thus stated: objects that have been previously united as parts of a single mental state tend to recall or suggest one another. This, however, is so obviously open to the objection that it does not account for the formation of *new* associations never before perceived, that it has been modified into what has been called the Law of Integration, "which may be defined as that whereby the mind, in all its efforts, completes a circle of thought—in other words, brings a whole into all its representations. If we suppose, for example, the case of one face, from some point of likeness in it, suggesting another, let us see what is the mental process which takes place. The mind, on

Redintegration.

Integration.

apprehending the particular point of resemblance in the face before it, immediately begins to complete the image thereby recalled. It feels that it has got a part of a whole formerly familiar to it, and its immediate aim is to bring into view that whole. In ordinary instances the image completes itself instantaneously, and we are not therefore conscious of any such aim; but in some instances, it is only after frequent efforts that it does so (as when we see a face resembling one that we cannot yet recall), and then we become distinctly conscious of the reproductive operation. The eye, or mouth, or whatever part of the strange face is recognised as familiar, is fixed upon by the mind, and becomes the centre of a representative picture in which the mind has no satisfaction till it is completed. In the case of the law of contrast, as when night suggests day, good evil, a dwarf a giant, the mental process is still more obviously of this integrating character. For, in fact, the one mental conception here directly involves the other, and is only fully intelligible in relation to it. Each idea is to us only what it is on account of its opposite. In passing from the one to the other, therefore, the mind is simply completing the complex image, one side of which is always the necessary correlate of the other. The same seems to hold equally true of the law of co-adjacency, as when a certain house recalls the friends we met—the conversation we had in it; or when one event recalls another which had happened at the same time. . . . . In speaking thus of the process of reproduction as throughout of an integrating character, it may be necessary to guard against our being supposed to say that the mind necessarily impresses a whole upon all the successive train of its ideas. This, on the contrary, we know it frequently does not do, the last link in the train having often no relation to the first as parts of a common whole. Mental succession is not unfrequently, as in reverie, a mere straggling array of scattered images. The integration does not proceed, as it is not necessary that it should, all along its course, but only from step to step. The general train may thus present a very incongruous mixture of ideas, while it has yet, at every step, strictly obeyed the great law of mental development.

We may further observe that it is not necessary, as we might be apt to think from a first confused conception of the law, that the facts of a train of association should have previously co-existed in the mind. In some cases they have co-existed, and to this fact of their co-existence is owing their tendency to reproduce one another; but more frequently they have had no such previous alliance in the mind. An object never before perceived may suggest an old familiar object; while again, an object frequently perceived may suggest, in different moments, very different and even quite opposite trains of thought. Were it not for this characteristic of the principle of association, the field of our knowledge would have been comparatively narrow, confined, as it must have been, to the relations which from actual observation, we had stored up in our minds. We would never have been able to get out of the past wheel or circle of our thoughts. As it is, the suggestive capacity, continually started by everything around us, is, in all active and cultivated minds, ever entering on fresh fields of intellectual interest, and acquiring fresh stores of knowledge."*

SECTION III.

KINDS OF REPRESENTATION.

Phantasy.

§ 104. The simplest mode in which the representative faculty operates is illustrated in reverie. Objects are presented before consciousness singly or in groups, without any particular order and without any connection with a place or a time in which they have previously been known. This mode of representation, in which phantasms are isolated from their determining circumstances, has been called phantasy. Dreaming is a well-known example of it. Images come spontaneously into the mind, and are supposed to have a present reality. These images may be complete in themselves, but they are separated from the various relations in which they may have been previously observed. This phantasy, this simple bare representation of images, is the least complex, and, at the same time, the least perfect mode of representation. It usually takes place in a state of mental inactivity, as in reverie or dreaming, when there is no *voluntary* putting forth of effort, or in some abnormal condition, as fever or insanity, when the images of a period long past come up vividly before consciousness, although perhaps for years they had been dormant. Thus in simple phantasy the mind appears to be, to a great extent, passive; there is no voluntary effort to *fill up* the circle of knowledge connected with any particular phantasm. Since this imperfect mode of representation is usually found in quiescent, abnormal, or diseased conditions of the organism, physiologists have given great attention to it for the purpose of discovering the organic conditions upon which the power of representation depends. As, however, we are not at present interested in this question, we shall proceed to the consideration of a more perfect mode of representation, and one with which we are more familiar.

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* Tulloch's "Theism," pp. 211–14.

Memory.

§ 105. Memory is not the simple representation of phantasms or images before consciousness; it involves that, and something besides; the additional elements which it involves appear to be the following:

(1.) There must be *Recognition;* that is, the image at present before the mind is known to be the same, although numerically different, as one previously known. When we see the face of a friend whom we have not seen for a long time before, we *recognise* him, that is, we know that we have seen him before; and in the same way when an image of an absent friend presents itself to the mind, we recognise it.

(2.) Memory necessarily involves the element of time. The very nature of *recognition* implies that the present act of the mind has a reference to some past time, and that the object *recognised* is believed to have been previously known.

Although there may be many other circumstances connected with an act of memory, yet these three which we have mentioned—the simple phantasm, the recognition, and the reference to a past time—appear to be all the elements which are *essential* to memory.

Memory of events in time.

§ 106. Memory, as a form of representation, we have seen to be essentially an *integrating* process. Some image presents itself before the mind, and we recognise it, that is, we believe that we have known it before *in connection with* a number of other mental objects. The act of memory is not complete until we are able to recall the other circumstances with which the recognised phantasm was originally connected in our knowledge. To remember a thing, in short, is *to posit* the image of the thing in the midst of a greater or less number and variety of other images in connection with which we have already known it. We must be able to posit it in time, but as time is known to us only by a succession of events or images, the giving of a position in time to the object of memory implies an ability to say what events preceded, co-existed with, and succeeded it. Hence, when we try to remember an event, we are satisfied when we are able to say that it occurred about the same time or soon after another event with which we are more familiar.

And the greater the number of the circumstances or events in the midst of which we are able to posit the object of memory, the more complete is the act of memory. These accompanying circumstances may be of any kind; may be sensations of our own minds, actions performed by us or others, objects existing in space, even arbitrary artificial signs indicating time, place, or circumstances.

Scientific memory without time.

§ 107. There are, however, forms of memory in which the reference to time does not appear to be essential. A student wishes to demonstrate the forty-seventh proposition of the First Book of Euclid; but he has partially forgotten it. He does not attempt to connect his partial knowledge with anything past. He looks at the figure and endeavours to recall the relations which exist between the different parts of which it is composed. And a perfect memory of this proposition has probably no reference to past time at all, but is simply a representation of the lines and angles of the figure before the mind, with a clear perception of the relations existing between them, and of the conclusion which follows from the comparison of these relations. Similar remarks might be made with reference to our memory of other systems of knowledge.

There is also a form of memory which is involved in the acquisition of practical habits, from which the element of time appears to be eliminated. When a musician remembers a piece of music, it is not meant merely that the musical notes are represented before the mind's eye in their proper order, but also that he can, without hesitation or difficulty, strike with his fingers upon the proper keys, and produce in quick succession the sounds indicated by the musical characters. And, in this case, the want of memory consists in an inability to think of the particular series of musical notes which should follow or precede some other remembered parts of the piece.

Thus, perhaps, it would be more accurate to consider *recognition* as the one essential characteristic of memory by which it is distinguished from simple representation; and to add that when the object of memory is a past event in our own lives, the act of memory involves also the positing of its object amongst a greater or less number of other objects or events related to one another in a past time.

Expectation.

§ 108. There is another mode of representation differing from simple phantasy in having a reference to time, and differing from memory in referring to future instead of to past time. This we call expectation or prevision. In the process of perception this plays a very important part. The different qualities of which an object of perception is composed have been so constantly found in our experience united together, that when we perceive any one of them we expect to find the others. We have always found that the coloured globular body which we call an orange contains within it a pleasant acid juice and several seeds. Whenever we see an orange we *expect* to find within it what our past experience tells us is likely to be there. Thus, expectation is founded upon memory; and, upon the constancy and invariability of the experience with which memory furnishes us will depend the confidence of our expectation. The perfection of expectation is prevision. The astronomer can predict with certainty when an eclipse of the moon will take place, because his calculations are founded upon a long series of accurately-observed and constantly and invariably-recurring phenomena. The weather-casts of the meteorologist do not give rise to the confident expectation produced by scientific prevision, because the phenomena observed are exceedingly variable and inconstant, and it is known that there may be innumerable disturbing causes at work. In daily life the principle of expectation is of the greatest practical importance in guiding our conduct. One of the forms of superstition consists simply in founding an expectation upon some sign or omen which is connected by tradition with the event expected. The slightest reflection might show the utter want of connection between the sign and the object of expectation; but the association has been formed in childhood through the instructions of parents or relatives, and even after reflection has shown that it does not conform to truth or reality, its power can scarcely ever be completely overcome. A reasonable expectation is founded upon the remembered or well-attested experience of ourselves or others. We become acquainted, for example, with persons, and have opportunities of observing how they speak or act in particular circumstances. We form an estimate of their character, that is, we construct in our minds a certain kind or class of ideal actions which we expect them to perform in certain circumstances. The better we know them, the greater confidence have we in our expectations. Thus, in all the circumstances of life, expectation, reasonable or unreasonable, is an important guide of our actions; and our success in life to a great extent depends upon the carefulness and ability with which our expectations are formed.*

SECTION IV.

KINDS OF REPRESENTATION—CONTINUED; IMAGINATION.

Representation combined with other powers.

§ 109. The power possessed by the human mind of representation is exhibited in a still more important form than any which we have yet considered. Hitherto we have studied the representing power in its simpler operations, in simply recalling in their natural order the objects of our previous knowledge. We have now to study the power of representation as combined with various other powers and exerted in various interests. And in this form of the operation of the representing power, we shall see that the objects represented are modified and rearranged in various ways to suit the design of the individual. This form of representation is usually called the constructive or plastic imagination, to distinguish it from the simple representation of objects in phantasy and memory. Before proceeding to consider the most important special applications of the imagination, we may refer to certain general principles of its operation.

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* Although the most essential element of expectation is a mental representation referred to a future time, yet it is in reality founded upon inference, or a kind of implicit inference.

§ 110. The following are the most important modes in which the constructive imagination is found to operate:—

Modifications of mental phenomena caused by imagination.

(1.) In imagination there may be a separation of the parts or qualities of which any object is made up. We can imagine a horse without its head; a flower without its colour or smell; a bird without its wings; a human being without some quality or character which he now possesses.

(2.) In imagination, parts or qualities thus separated from their natural relations may be recombined so as to form new objects. Centaurs, winged bulls, griffins, &c., are illustrations of this process.

(3.) In this reconstructive process, the elements of the new object may be greatly and variously modified, may be changed in shape, size, or excellence, either for improvement or deterioration. Conformity to the truth of nature is not at all an essential feature of the products of imagination.

(4.) In imagination, when we wish to represent to ourselves something unknown, we can do so only by employing elements taken from things known. We are frequently bound to believe in the existence of things which we have not directly known, and

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probably can never know. In this case the imagination clothes the unknown with forms taken from the known.

(5.) In the object which the imagination constructs there must be a certain congruity between the elements of which it is made up in order to render the imaginative act possible. To imagine a square circle, for example, would be impossible.

§ 111. We shall now study the operations of the imagination as they are found in the most important departments of human mental activity,—in science, in art, in ethics, and in religion. It may perhaps be thought somewhat incongruous to unite imagination with science, as science is usually supposed to deal only with known facts. But the truth is that nearly all the great discoveries of science have been the result of an effort of imagination; and many of the greatest men who have advanced scientific knowledge have been men gifted with a strong constructive imagination. Let us study the part which imagination plays in the progress of scientific discovery. Some phenomenon, say the fall of rain from the clouds, requires to be explained. It is observed that dark clouds appear in the sky; the lightning flashes, the thunder rolls; the rain falls down in torrents; the cause of all this is unknown, and people set their imagination to work to think of what the cause may be. In other words they frame an hypothesis. Now in all cases, the nature of the hypothesis framed will depend upon the nature and amount of the knowledge or belief possessed by the

Imagination in science illustrated.

persons who frame it. The uneducated Hindu peasant sees the dreadful commotion in the skies, and imagines that the elephant of Indra is up there throwing down the water which he has taken from the sea with his trunk. If any difficulty presents itself, it will soon be got over by the reflection that Indra is great and can do all things. This is an illustration of a very primitive kind of hypothesis framed for the explanation of phenomena. But as men advance, they observe more closely the phenomena of nature. Vapour is frequently seen rising from the surface of water; especially when heat is applied this takes place. At length some genius, by an effort of imagination, sees the analogy between the formation of clouds in the heavens and the accumulation of steam in a room in which there is heated water. This observation is a hint which may assist in the formation of a new hypothesis. One hint after another of a similar kind is taken advantage of, until everything connected with the thunderstorm is found to be analogous to some well-known natural operation. Then the mind is satisfied and the hypothesis becomes a theory.

Further described.

§ 112. The foregoing is an illustration of the manner in which nearly all the most important scientific discoveries have been made. Some great series of natural phenomena requires an explanation. Its cause is unknown, or people are dissatisfied with the explanation hitherto given. The imagination of some Newton is brought to bear upon the problem. His genius enables him to imagine that the unknown cause of the phenomena in question is identical with the cause of some familiar event; he sees an analogy between the phenomena, and he imagines an identity of cause; the result is a new hypothesis. After the formation of the hypothesis, its value requires to be tested by ascertaining whether it is able to explain all the phenomena.

Imagination of hypothetical forces.

§ 113. There are hypothetical explanations of phenomena which can *never* be the objects of direct observation, and in this case imagination may be occupied in an endeavour to represent them before the mind. The cause of the sensation of light or colour, for example, is and always must be hypothetical. The generally accepted hypothesis is that the whole of space is pervaded by a very refined ether, and in that ether vibrations of immense minuteness and rapidity are being perpetually propagated in straight lines from luminous bodies. These vibrations, striking upon the retina of the eye, cause the sensation of light. Now in this hypothesis the vibration is the essential element; the ether is an hypothetical addition, invented for the purpose of making the imagination of the vibration possible. A vibration with nothing to vibrate is inconceivable; hence it was necessary to invent an hypothetical ether in which the vibration could take place. But in imagination, ether is represented as simply a refined kind of atmosphere; and the vibrations are represented as analogous to what we are able to observe when we look at a distant object through a column of heated air.

Thus imagination represents the unknown cause of our visual sensations by analogy from phenomena which we know. We clothe the unknown with forms taken from the known. But it must be remembered that this does not remove the hypothetical character of the explanation. That which, from its nature, can never be presented to consciousness, can never be truthfully represented in imagination. But yet it is necessary, when we think of hypothetical causes which from their nature are unknown, that we should imagine them as invested with a *phenomenal clothing* in some respects analogous to what we have known. Such is the limitation of the human mind.

Imagination in art.

§ 114. We now proceed to examine the operations of the imagination as found in the production of works of art.

Mechanical.

In the ordinary mechanical arts, the chief exercise of the imagination is seen in the skilful adaptation of means to ends. Some work requires to be done; the mechanical genius is able to see what particular means, or what combination of means, will suffice to do the work. The means at hand are, generally speaking, of two kinds; artificial instruments, and natural forces. A great deal of genius has been at different times shown in devising plans for connecting the latter with the former, for connecting the natural forces of the world with the artificial instruments of man's construction. The windmill, the water-wheel, the steam-engine, the electrical machine, are all illustrations of this connection. And the imagination of mechanical inventors has been chiefly exerted in devising schemes for getting hold of, governing, guiding, or modifying the various forces of Nature.

§ 115. In the fine arts we have a higher, although perhaps not a more useful, exercise of the imagination. Poetry, painting, sculpture, music, and architecture are the usually recognised fine arts. In the whole of these the imagination is exercised in calling up and combining images in the mind fitted to express or to excite some emotion. The artist exerts his skill generally for the *æsthetic* purpose of exciting *pleasant* emotions. But art is also frequently employed to excite in the mind emotions of sublimity, fear, horror, or disgust. In all cases the imagination is exerted in the construction of an object or the composition of a work which will be fitted to call forth in the mind of the observer the particular emotion, or combination of emotions, designed to be produced. And generally speaking, it is by the study of Nature and the construction of the work of art after the analogy of Nature that the designed effect can be successfully brought about. The artist can only employ the materials which Nature gives him, and whether he tries merely to imitate Nature or to produce something better than Nature, his imagination must be employed in moulding, reforming, or idealising natural things.

Poetry.

§ 116. In poetry the physical material with which the artist produces his effect is language. But the words are only the signs of the mental objects of the poet's imagination; and it is in the calling up and arrangement of these mental objects that the poetical imagination consists. Hence versification, rhyme, and other mechanical contrivances are not essential to the poet's art. If the language employed is fitted to call up the same ideas in the mind of the hearer as in the mind of the poet, that is all that is required of it. The aim of the poet then is, by means of words, to conjure up before the mind of his hearer or reader, images of such a nature as will excite the special kind of emotion which he desires to excite. There are various species of poetry in which this is attempted, and perhaps it is difficult to find amongst them a common characteristic. But generally speaking it appears essential to the production of the effect that there should be a certain *illusion* produced on the mind of the hearer. He must be made for the moment to believe in the reality of what he only imagines. The true artist *realises* the products of his imagination. Hence a highly poetical imagination is sometimes thought to be akin to madness.

> Lovers and madmen have such seething brains,
> Such shaping fantasies that apprehend
> More than cool reason ever comprehends.
> The lunatic, the lover, and the poet
> Are of imagination all compact.
> One sees more devils than vast hell can hold—
> That is the madman; the lover, all as frantic,
> Sees Helen's beauty in a brow of Egypt.
> The poet's eye, in a fine frenzy rolling,
> Doth glance from heaven to earth, from earth to heaven,
> And as imagination bodies forth
> The forms of things unknown, the poet's pen
> Turns them to shapes, and gives to airy nothing
> A local habitation and a name.
>
> M. N. D.—Act v. Sc. 1.

Subjects of poetry.

§ 117. The most important objects of the poet's imagination are scenes in Nature, historical events, facts of human life, different types of human character, and the various objects of the unknown spiritual world. All these classes afford innumerable and infinitely varied objects suitable for the excitement of the most varied emotions in the human mind. It would be impossible within our limited space to enter into a full discussion of the questions which suggest themselves in connection with this subject. But there are two types of the poetical imagination to which we must refer. One of these we may call the descriptive; the other, the dramatic. In the former there is an ability to describe scenes and events, it may be with great accuracy and great beauty, as seen from the poet's own subjective standpoint; in the latter there is an ability to *construct* an ideal character, quite distinct from the poet's own character, and imagine the feelings, words, and actions suitable to that character. Byron is an illustration of the first; Shakespeare of the second. Byron's Childe Harold is admirable, because it is descriptive, and he was able to describe with elegance, and indulge in the most appropriate reflections regarding the object of his description. Byron's *dramas* are failures, because every character is simply himself disguised. Shakespeare was able completely, in his dramatic efforts, to divest himself of his own character, as it were, and assume that of the person whom his imagination created. Thus he was able to construct a wonderful variety of characters;

Types of poetical imagination.

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and in every case he has ascribed to them the feelings, words, and actions which everybody will acknowledge as *natural* to these characters. In this wonderful power of forgetting himself and being able to imagine how all kinds and descriptions of people felt and would naturally act in particular circumstances lies the greatness of Shakespeare.

Painting and sculpture.

§ 118. Painting and sculpture differ from poetry in being more restricted as to the objects presented to the imagination and in employing a different material as the sign of those objects. The poet can roam unrestrained in every field which his imagination can reach; the painter and the sculptor can only represent what were originally objects of sight. In a very primitive period of the history of civilisation, in Egypt, in Babylon, and in India, the sculptor's art was usually employed in the representation of the national ideas of the deity. The huge size and the grotesque construction of the figures which have been preserved to this day, reveal to us the nature of the religious imagination of the people of these old days. The different parts of human and animal bodies, fearfully exaggerated in size and proportions, and strangely combined together, are formed by the artist into huge and uncouth figures, intended to express the qualities which the people attributed to their deities. In Greece, the painter's and the sculptor's art became more natural; the imagination was exercised to produce beautiful figures and features which should imitate, or even emulate, Nature; the exaggeration and the grotesqueness of the old artists were discarded, and art was cultivated for the sake of grace and beauty. The artist did not merely seek to express with truthfulness the beauty of Nature, but by combining the most beautiful forms which could be discovered into one figure, or by idealising those combinations of features or qualities which are found in Nature, he sought to surpass the beauty of Nature in his imaginary *beau-idéal.*

§ 119. Music, like the other fine arts, was originally enlisted in the service of religion. Like poetry it appeals to the sense of hearing instead of the eye; but its material consists of musical notes instead of articulate words. The arts of the musician and the poet were originally usually combined together; the bard *chanted* his own or other people's productions. But in time a partial separation took place, and the art was cultivated for the sake of the pleasing emotions excited by the melody and the harmony of musical sounds. The power of music over the emotional part of man's nature is illustrated in the mythical legends of ancient times regarding Orpheus and his lyre; we have a fine description of it in Dryden's famous Ode on Alexander's Feast; and in the musical recitations by the Indian pandits of the Ramáyana and the Mahábhárata in the present day we have a survival of what was no doubt common in Homeric and Vedic times. The effort of the imagination in music is exerted not merely to produce a succession of pleasing sounds, but chiefly to produce a succession of sounds which will harmonise with and express certain emotions. It is this relation of the musical sounds to our emotional nature which gives to music all its power. There is one style of music suited to cheerful, social festivities; another to the mournful solemnities of the funeral procession, another to the measured tread of armed men advancing to the field of battle. And the art of the musician is exhibited in adapting his musical compositions to the nature of the emotions which he wishes to excite, or with which he wishes his piece to harmonise.

§ 120. The art of architecture originated in an attempt to beautify and adorn the temples of religion or the houses of the wealthy. There is, therefore, in this art a combination of beauty with utility. A regard to usefulness and stability, therefore, ought to govern the architect in deciding upon the principal parts of the building; these qualities being secured, the imagination is at liberty to add such lines and figures of beauty as may seem suitable. The art of the architect at different times has invented a considerable variety of style in the structure and ornamentation of buildings, for a description of which we must refer the reader, who wishes to pursue the subject, to the numerous works of professional men who have devoted themselves to the subject.

We have now concluded our brief account of the different special modes in which the constructive imagination of the artist operates, and with one remark we dismiss the subject. The exercise of the imagination in the study or in the construction of works of art is fitted to have an ennobling and refining effect upon the mind. It turns away the attention from gross, vulgar, and merely sensuous objects; and, if properly directed, cultivates those higher and purer emotions which give to human life its best pleasures and to human character its greatest excellences.

SECTION V.

KINDS OF REPRESENTATION—CONTINUED; IMAGINATION IN ETHICS AND RELIGION.

The ethical ideal.

§ 121. In practical life the activity of men is directed to the attainment of some End. The Ends which men propose to themselves are very various; pleasure, wealth, power, fame, and many others. But in every case the End of a man's life is the product of his constructive imagination; it is an *ideal* composed of all the elements which, from his nature, he is led to think *desirable.* The ethical ideal must always be constructed out of materials furnished by the actual. In our experience we enjoy many pleasures; but we think of pleasures better and more lasting than those. In our experience we perform, or we witness performed by others, actions which we approve of, which we consider praiseworthy; but we are able to conceive better, more generous, or more noble actions. In short, we are able in our imagination to rise, as it were, above our experience, and from *what is* to construct the ideal *of what ought to be.* We are not here concerned with the nature of the power by which we are able to perceive the *ought* or duty. That is a question of ethics. But we may examine briefly the nature of the process by which the ethical ideal is constructed.

The ideal introduces conflict.

§ 122. In all men there are certain primary distinctive impulses and springs of action—appetites, desires, passions. A person who is completely under the control of these, who is governed by them without reference to the feelings or the interests of others, is absolutely *immoral.* To be moral implies that these natural impulses are *controlled* and *regulated* by the voluntary power of the individual with reference to some worthy end. But they will never be controlled unless the individual sees that their uncontrolled exercise leads to evil, that is, unless he sees that there is some *higher good* to be attained by controlling them. The conception of this higher good is the ideal which he forms. The general effect of the formation of an ethical ideal is to make one dissatisfied with himself, to make him feel that there is an excellence of character to which he has not yet attained. There is thus a conflict produced between the actual impulses and desires on the one hand, and the ethical ideal on the other, as to which of the two shall govern the conduct. The result of this conflict is of the most momentous importance to the happiness and welfare of the individual.

Formation of ideal.

§ 123. With reference to the history of the formation of the ethical ideal it is difficult to speak with definiteness. The ideal of one person is often widely different from that of another; of one nation from that of another. There can be no doubt but an ideal of some kind is usually formed by every one by means of reflection upon the comparative worth of different aims or objects in life. But the greatest influence is exerted by people or nations coming into contact with those who have higher moral conceptions than themselves. The power which a man of true moral worth sometimes possesses in guiding the formation of an ethical ideal in the minds of others is very great. Thus it is true in the history of morals that it is very slowly and with great difficulty, if at all, that an isolated race can rise to a higher moral elevation; while the influence of an individual or of a nation possessed of high moral qualities upon a race not so favoured is sometimes enormous.

Idea of God.

§ 124. The efforts of the imagination in religion are chiefly exerted in constructing a representation of the object of religious worship. Amongst lower and uncivilised races the imagination is usually assisted by the mechanical construction of actual material idols or images. But the representation of Deity under material forms degrades our conception of a spiritual Being, and amongst all monotheistic races the representations of the Deity are mental. The idea of Deity which the human imagination constructs has varied greatly at different times and amongst different peoples. It is also a very complex idea, perhaps the most complex which can be formed. But the most important elements which have been comprehended in it appear to be the following: The

Deity is imagined as the all-powerful and all-intelligent First Cause, the Moral Governor, and the Universal Father. The first of these elements of the conception identifies God as the source and the guide of the various physical forces of Nature; the second attributes to Him the moral control, that is, the rewarding and punishing of human actions; the third represents Him as having a direct and special interest in the welfare of all His creatures.

Religious ideal founded on analogy.

§ 125. Much might be said regarding the difficulty of uniting these various elements in one complex representation, and regarding the many very imperfect and distorted conceptions which have been formed. But we can at present only point out that the imagination can construct the idea of God only by analogy from things known. And as the qualities of our own human nature, either known to ourselves by consciousness or presented to us in the lives of others, are the most noble objects of our experience, they are naturally the types from which our conception of Deity is formed. The idea of God as our moral Ruler and our Father being constantly kept before the mind, there can be no doubt but the influence of this idea over conduct and life is greater than that of any other. When, by an individual, duty is performed and good is done "as ever in his great task-master's eye," there is the highest attainable guarantee that he is worthy of any trust which may be reposed in him.

SECTION VI.

PECULIARITIES OF REPRESENTATION.

Illustrations of peculiarities.

§ 126. There are great differences between different people with reference to their power of recalling particular classes of facts. Some people have peculiar ability in remembering names; others in remembering faces; others in remembering dates. It may perhaps be assumed as a general principle that when any event or circumstance has excited a strong interest in an individual's mind, it will be easily and readily recalled afterwards. The power of memory may be very greatly cultivated by a suitable kind of training. Generally speaking it may be laid down as a rule, that the cultivation of the habit of giving close attention to any subject of study and obtaining a comprehensive and systematic knowledge of it is the most important condition of being able afterwards to recall it. There are, however, many artificial systems of mnemonics which chiefly depend upon some principle of association. Particular names or particular dates are associated in pronunciation with some arbitrary sign which serves to recall that which is signified. Some system of this kind is frequently resorted to for the purpose of enabling students to pass examinations. An artificial system of mnemonics of this kind is about as useless as the system of examination which renders it necessary.

Suggested representation.

§ 127. There are many peculiarities which we might mention in the series of representations which, in the minds of different persons, are suggested by particular objects. To different travellers going along a road or visiting places of interest, the objects presented to the eye will suggest to the mind widely different lines of reflection. The artist, on visiting the Falls of Niagara will admire the grandeur, the sublimity of the scene; the practical uncultured American will think of the great loss of water-power which might be utilised in driving numberless mills. The followers of particular professions have peculiar lines of reflection naturally suggested to them by the objects of their knowledge. These peculiarities in the series of representations depend upon the circumstances of the individual, upon age, sex, country, education, social position, prevailing feature of character, and many other things which might be specified.

That which gives to this subject its greatest importance is the practical effect exerted upon one's character and welfare by the spontaneous series of representations which pass through the mind. The mind is very injuriously affected by continually indulging in thoughts of sensuous pleasures, by cherishing feelings of anger or unworthy suspicions towards others, by thinking always of difficulties and hardships and thus taking a gloomy view of life. And it should be remembered that there is a certain voluntary power which every one has to a certain degree, and ought to cultivate, of regulating and controlling the representations of his mind. By a voluntary effort one is able to banish from his mind evil and injurious reflections, and dwell upon those of a better and more ennobling kind. And the exercise of this voluntary power is perhaps the most important element in self-culture. There is scarcely any power which one can possess so valuable to him as that of self-control, and this not merely the control of external expression and action, but of the feelings and thoughts of the mind.

Peculiarities in constructive imagination.

§ 128. In the constructive imagination also there are important differences to be noted between different individuals. And here, perhaps to a greater extent than in any other department of the human mind, we may observe *inherited* peculiarities. *Poeta nascitur, non fit.* The mechanical genius, the poet, the musician, the painter, the sculptor, and the architect, if they are not mere mechanics, but *poets, makers*, men of creative genius, are *born*. They bring with them into the world the capabilities of becoming what they afterwards become, and what they could never become were it not for the inborn genius which they have brought with them. Remarkable examples might be given of persons who, at a very early age, have exhibited powers in mathematics, in music, in poetry, in sculpture, which could not possibly have been acquired by education, and which must have been inherited. But from whom the inheritance has been derived, and how it has been transmitted, will probably always remain insoluble problems.

SECTION VII.

REPRESENTATION OF ABSTRACTIONS.

Abstraction described.

§ 129. It is frequently necessary to withdraw the mind from some of the qualities of objects for the purpose of giving undivided attention to others. This process is called abstraction. The quality or qualities to which attention is given are properly said to be prescinded from the others; the mind is properly said to be abstracted from the qualities to which attention is not given. In ordinary usage, however, this distinction is not attended to, and the quality singled out for special attention is said to be abstracted from the others, and is usually called an abstraction. There may be abstraction from individual objects of perception, as where the colour or the figure of an object is attended to apart from its other qualities. And we have now to consider how the representative faculty operates with reference to these abstractions.

Representation of abstract sensations.

§ 130. Considering first the qualities of a body which correspond to special sensations, we observe that their presentation can be effected only by the help of the special organ of sensation concerned in the original intuition. A colour can only be represented in connection with the eye; a smell in connection with the nose; and so on. Thus by the aid of the organs of sense a representation may be made of particular qualities abstracted from an object. But there is a series of so-called qualities, consisting of extension, figure, position, and other modes of space which must not be confounded with those qualities that are the correlatives of sensations. Qualities that are the correlatives of sensations are represented by the aid of the one special sense-organ with which they are peculiarly connected. Extension may be represented in connection with any sensation located anywhere in the sensorium, but notably in connection with the sensations of colour and the tactual sensation. It is to be observed further that the connection in representation between the phantasms of colour and touch on the one hand, and the idea of extension on the other, is *inseparable.* It is impossible to represent a colour or a tactual sensation except as occupying some form of space. And in so far as *any* sensation is specially located in any part of the sensorium, the same inseparable connection with some form of space is found to exist. We conclude then that we are able to represent the qualities of bodies which correspond to our sensations apart from one another; that we can make abstraction of the colour, or the smell, or the hardness, or the taste of an object, and represent any one of them apart from the others. But when we attempt to represent colour or hardness, we are compelled to join some form of extension with them; there is such an inseparable connection between the two that a separation, even in thought, is impossible.

§ 131. Let us consider now the nature of our representation of extension or space. Extension or

Of space or extension.

space, considered apart from the objects which occupy it, is undoubtedly an abstraction. Extension, we have seen, is the form of which the colour, hardness, and other qualities of bodies are the matter. And the question arises whether we can represent the form apart from the matter; we have already seen that we cannot represent the matter apart from the form, and a little reflection will convince us that the reverse is equally true. The representation of pure space or pure empty extension is an impossibility. For when we attempt to represent space, we invariably do so by thinking of the possibility of moving through it. We think that no matter how far we travel through space, there is still a possibility of going farther. And if we attempt to conceive a limited portion of space we must do so by connecting it with some sensible boundary, or some collections of qualities, or some possibilities of motion. This impossibility of representing pure space, apart from the idea of some qualities occupying it or some objects moving through it, might be inferred from the nature of our conception of space. It is an abstract formed from particular relations of extension. But extension is the form of intuition, the form in which objective phenomena are perceived. But the form of phenomena is not itself a phenomenon; and we therefore need not expect it to be capable of being represented as one. The doctrine which we have maintained regarding our representation of space does not affect the question as to the nature of its actual objective existence. That is a question which belongs rather to metaphysics than psychology, and which, therefore, we shall not at present discuss.

Logical abstractions.

§ 132. In considering the possibility of representing logical abstractions we must anticipate a little, and suppose the reader to be familiar with the nature of the process to be afterwards described. The great majority of the words in every language are the names of classes of objects, as man, triangle, tree, river; and the question we have at present to consider, is how, if at all, can we represent to our minds the objects indicated by words such as these? And it must be remembered that there are in Nature no things corresponding to these general names. There are plenty of individual men, tall or short, black, white, brown, or olive; but there is no such thing as man in general as distinguished from particular individuals. So there are triangles, equilateral, scalene, right-angled, and so on; but triangle in general is unknown. A little reflection will show not only that such a thing as man in general does not exist in Nature, but that it is incapable of being represented in the imagination. For if we attempt to represent what we mean by *man* to our mind, we shall find the representation assuming some particular form and colour, and other qualities. We cannot help it. And in the same way of all other names which indicate classes of objects. It is impossible to represent the connotation of a general name, as for example, triangularity, without bringing in along with it, more or less definitely, the other qualities or parts belonging to some particular objects of the class.

Difficulty stated and obviated.

§ 133. It may be asked, then, how are we able to understand the definition of a class of objects, as, for example, a triangle is a figure bounded by three lines? Into the definition there are not introduced any peculiarities belonging to particular triangles, and yet we are able to understand its meaning. The explanation of this is probably to be found in the relation between language and the object of thought. When a word has become attached to a particular object or class of objects, it may frequently be used without bringing into the mind the things denoted by it. And especially when words have become very familiar, they are joined together in propositions, and the propositions are assented to, although there is in the mind no attempt to realise their meaning. Thus a familiar proposition such as, A triangle is a three-sided figure, is listened to; it has been thoroughly understood long ago, and deposited in the memory as something to be received without question; and consequently when the proposition is pronounced it excites no mental activity except a vague belief that it is quite correct. But if an attempt be made to realise a general name, or to understand a proposition in which a general name is the subject, there must be a representation of a more or less complete and definite object.

§ 134. The employment of words indicating classes, or general qualities, or general modes of action, as if they represented real things, has led to many erroneous conclusions. And consequently it is important that words and propositions should be

Realising of abstraction.

frequently tested by attempting to realise their meaning, that is, by attempting to form a representation in the mind of the things which they denote. For example, if such a collocation of words be formed as, a square triangle, its illegitimacy would be at once seen by an attempt at representation. The idea of squareness and of triangularity are incongruous; they cannot be joined together in the same representation.

Test of truth.

Thus the possibility of representation is an important test of truth. It must not, however, be accepted as a test without certain limitations. There may be representations formed which have no corresponding object in Nature. The formation of a centaur or any other monstrosity is quite possible and quite common. And thus the possibility of uniting in a representation any given number and kind of elements or qualities is no guarantee whatever of objective truth. But, on the other hand, the impossibility of representation is, in certain circumstances and cases, the only test of truth which we possess. For example, in the proposition—Two straight lines cannot enclose a space—the absolute incompatibility between the representation of two straight lines and that of an enclosed space is to us the guarantee, and the only guarantee, of the truth of the proposition. And we might refer to certain other simple propositions regarding primary objects of intuition in which inconceivability is unquestionably the test of truth.

The test applied to complex objects.

§ 135. When, however, we take into consideration highly complex objects of thought, it becomes much more difficult to apply the test. An apparent impossibility of representation frequently arises simply from want of experience. For example, a prince of Siam once found it impossible to conceive water becoming solidified into ice. Ignorant rustics cannot conceive the possibility of fish flying through the air. These and other examples show that there may be an apparent impossibility of conception arising from the want of having had the requisite experience, and that the inconceivability must not be taken as a test of truth until it has been criticised and its nature discovered.

General idea has no separate existence.

§ 136. We have seen that it is impossible to represent a general idea, as that of man, triangle, except in connection with some particular individual belonging to the class. And this impossibility is taken as a sufficient guarantee that the general idea has no objective existence except as found in individuals. This is true of all general ideas connoted by general names, and formed by a process of logical abstraction. For example, one of the most abstract of all ideas is that of Being; but it is impossible to represent Being except as a predicate of particular existing things, and consequently it is absurd to speak of Being as having any objective reality. Similar remarks might be made regarding other logical abstractions, such as The Absolute, The Infinite. The same impossibility of representation holds good with reference to them, and the same absurdity is seen in attributing to them objective reality.

§ 137. There is another fallacy connected with

Laws of Nature as represented.

representation to which we must refer. There are certain uniformities in the operations of Nature which, being observed, are collected together and expressed in what are called Laws of Nature. For example, it is observed that material bodies always show a tendency to move towards one another when obstacles preventing them are removed. But amongst the heavenly bodies, when there is no apparent obstacle to prevent a general collision, it is found that certain bodies, the planets, move in elliptical orbits round central bodies of a larger size. Now, by many careful observations the laws of the motion of bodies in free space with reference to one another have been discovered. But these laws are merely expressions of the relations observed to exist amongst phenomena. And when we attempt in imagination to make a representation of a Law of Nature, we cannot do so except by imagining a variety of objects related to one another in such and such ways. To attribute independent reality to a Law of Nature, therefore, is illegitimate. And yet we frequently hear Laws of Nature spoken of as being causal agents, as *producing* the phenomena of whose order and mutual relations they are simply an expression. Generalisation from a number of facts of falling bodies gives no force of gravitation, but only the general truth that bodies fall when unsupported, and this can never be a cause.

Representation of non-phenomenal causes.

§ 138. We have hitherto considered the possibility or impossibility of representation as a test of truth with reference to the actual or possible objects of our

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experience. But there are some things about which we speak and reason which never have been, and probably never can be objects of experience. These are the hypothetical non-phenomenal causes which we postulate to account for the existence of observed phenomena. As an example we may give Force. We are able to observe motion, that is, a relative change of place amongst bodies. We ourselves exert effort when we find some solid body in our way. That which causes the change of motion and that which resists our muscular effort is not *observed* except in and through the motion and the effort. The inference of an objective Force independent of the motion and the effort is simply an hypothesis which we make to satisfy our own minds by accounting for the existence of the phenomenon. Moreover, this hypothetical Force can never be an object of experience; if it were to come within our experience, it would be a phenomenon, and require itself to be accounted for. The only way in which we can increase our knowledge of this Force is by learning how many kinds of phenomena it is capable of producing. We might, for example, have reason to conclude that the same Force which produced motion and resistance, was also the cause of heat and light, and the phenomena of electricity. The only way in which we can represent this Force to the mind is by investing it with some phenomena of which it is regarded as the cause. And yet we know that this is not a true representation. We know that that which from the nature of the case can never be presented to us as a phenomenon is not truly represented as one. Now here we have a recognised impossibility of representation which is not accompanied by a rejection from our belief of the hypothetical entity. And the peculiarity of this case appears to be that the entity in question is of such a nature that it can never, by any increase of our knowledge, become an object of our experience. And yet we cannot in consequence of the impossibility of representing it reject it from our belief, since it is necessary to satisfy a want in our mental nature, a desire to account for the existence of phenomena which we know are neither produced by ourselves nor self-existent.

CHAPTER V.

ELABORATION OF KNOWLEDGE.

SECTION I.

PREDICATION.

Process illustrated.

§ 139. WE now advance to the study of the highest psychological process which we propose to consider, and which we have designated by the name Elaboration. We have already studied many illustrations of this process in the preceding portions of our essay; and we are now to examine into the nature of the process itself. A few remarks will make clear to us the general character of the problems which we must endeavour to solve. We see an object before us; we affirm that it has four legs and a head, and a mane and a tail; we call it a horse; we say that it is an animal, or a vertebrated animal, or a mammal. Now the question is, How or why do we make all these assertions? What mental processes are expressed in these assertions? Again we assert that the exterior angle of every triangle is equal to the two interior and remote angles; by what mental process have we been able to make such an assertion? Or perhaps we affirm that the earth is a spheroidal body revolving round the sun; or that the sun and all its accompanying planets are speeding rapidly through space. How are such propositions as these reached by our minds? Or further we may assert that Alexander the Great was the conqueror of Persia, or that Gautama Buddha was the founder of a wide-spread form of religion; why do we make such affirmations? In short, there are a great many things which we know, although they are not immediately under the observation of our senses; there are a great many things apparently very different from one another which we connect together in various ways in our minds; there are a great many things which we firmly believe, although they have never been immediately known to us at all. Knowledge and belief of these various kinds are the result of a process which we have called Elaboration, and which has been variously denominated, Thought, Reasoning, Reflection, and so on. Our duty at present is to examine the nature of our mental activity in this process of enlarging and elaborating our knowledge.

Predication explained.

§ 140. If we examine any part of our knowledge, whether the simplest or the most elaborate, we shall find that there is one manner in which it is uniformly expressed. When we look at an object before us we *assert* "That is white," or "That has four legs," or "That is a horse." When we compare different classes of objects together we *assert* "A horse is an animal," or "The sun is a luminous body." The result of any process of elaboration is a mental *assertion* of something or other. This result, expressed in language, we shall call *Predication.* In a certain sense, we have predication in the very simplest act of consciousness ; as when there is a consciousness of any simple sensation, there is a mental assertion or acknowledgment of the *existence* of that sensation. That a particular sensation, say of heat, or colour, or smell, *exists* is the expression of the conscious act in which it is known. But this implicit assertion of existence regarding the simple objects of consciousness can scarcely be called Predication as we must understand Predication in its present connection. Another illustration will make clear what we mean. An object of perception is before us; it is yellow, heavy, tasteless, and of a rounded irregular figure; the name *gold* has been associated with it; by a little experimenting we discover that it yields and changes its form by repeated strokes of the hammer. We assert, "This piece of gold is malleable." In other words, we predicate a certain quality, malleability, of the *object,* that is of the aggregate collection of qualities which we called gold. And our predication here means simply that the quality malleability *co-exists with* a certain number of other qualities to which there has been attached a certain sound, gold. Predication in this case is the assertion that one *object of our knowledge,* a particular quality, *bears a certain relation,* that of co-existence or co-inclusion, to *another object of our knowledge,* an aggregate of qualities having a special name.

Further explained.

§ 141. If we take any other case of predication we shall find something similar. We see two sticks or two lines placed side by side, and we perceive them to be either equal in length or unequal. We predicate that the one is equal or unequal to the other; or that the one object of our knowledge bears a certain relation, that of equality or inequality, to another. Similarly, there may be two colours placed before us; we predicate that the one of them bears to the other a relation of similarity or dissimilarity. So, when one object of consciousness is observed to appear immediately before or immediately after another, we predicate that the one bears a certain relation, that of antecedence or sequence to the other. Thus in all cases it will be found that *Predication consists in the affirmation that one object of our thought bears or does not bear a certain specified relation to another object of our thought.*

Basis of predication.

§ 142. We must now consider the ground or grounds upon which predication rests. How is it that we are able to make a predication regarding the relation which two or more objects of our thought bear to one another? Is there any other mental act of which predication is the result? A little examination will show that there is. When we observe two colours and predicate that the one is similar or dissimilar to the other, the act of predication is manifestly the result of *seeing* the similarity or dissimilarity of the two objects. Before we can predicate two lines to be equal or unequal, we must *perceive* their equality or inequality. In other words, predication is, in some cases at least, founded upon *Intuition;* we *intuitively* perceive

Intuition.

certain relations to exist between certain objects of our knowledge, and as the result of that intuition we predicate the relations. In other cases we must admit a different ground for our predications. For example, when we affirm, "The exterior angle of a triangle is equal to the two interior and remote angles," this is not the result of immediate intuition. There are various comparisons to be made before we can recognise the truth of the predication. So when we affirm that the earth bears a certain regularly varying relation in space to the sun, or in other words, that the earth revolves around the sun in an elliptic orbit, this predication is by no means the result of intuition, but of a mental process of a very complex kind. The more or less complex process by which we are enabled to predicate relations between objects of our thought which we do not intuitively perceive is called

Inference.

Inference. But, as a general rule, intuition and inference are combined in affording a ground for our predications. We *intuite* certain relations to exist, from which we *infer* certain other relations to exist, and predicate accordingly. The nature of inference will be explained hereafter; in the meantime we must give some attention to our intuitions.

SECTION II.

INTUITION.

§ 143. That act of the mind which we have called Intuition is the immediate knowledge which we have

Intuition is immediate knowledge.

of any object of consciousness. Thus consciousness is co-extensive with intuition, and therefore it might appear that the term intuition was useless. But it is convenient to have some word to distinguish the knowledge given in consciousness from the knowledge which is the result of inference, and the word we have used appears the best suited for that purpose. Moreover, consciousness is more properly applied to our knowledge of *objects* or *phenomena;* whereas we have now to bring into prominence *the relations between* objects. For these reasons we employ the term intuition in this part of our work to indicate the knowledge we have of objects given in consciousness and the relations between them. And manifestly, the *simple* objects of intuition are identical with the objects of consciousness. A sensation, an idea, an emotion, any phenomenon of the mind, is given to us in an intuition. In our study of perception we have examined into the nature and kinds of sensations, and now, leaving the consideration of the individual phenomena of consciousness, we must consider the relations between them as given in intuition.

Kinds of sequence.

§ 144. We have already seen that we have an intuition of the relation of *Sequence* existing between two phenomena, and that this intuition, when generalised, gives rise to our conception of time. But there is something else involved in this relation which is of considerable importance. The phenomena of consciousness are usually clustered together in a very complicated way, and there are frequently sequences taking place in what we may deem an accidental manner. For example, the sound of a bell rings in our ears; then we hear a carriage going along the road; then we see the postman coming to us with a letter. Now these various events may occur in any order, and it does not appear to be of any importance in what order they come, or whether they form a sequence at all. There is only an *accidental* sequence existing between them. But take another example. We see a flash of lightning; a few seconds afterwards we hear a peal of thunder; shortly after that rain falls. Now the first two of these events *cannot be reversed,* at least in our experience they *never have been reversed.* We may have observed peals of thunder succeeding flashes of lightning at a greater or less interval of time, but we have *never* observed the former *preceding* the latter. Thus there are sequences which, as far as our experience goes, are *irreversible.* There is another characteristic of certain sequences to which we must refer. Sometimes we may see a flash of lightning, but fail to hear the expected thunder: sometimes we hear the thunder without having seen the lightning. The antecedent of an irreversible sequence sometimes takes place without the consequent, or the consequent without the antecedent. But in other cases the sequence is *invariable.* A nugget of gold is suspended by a string; we observe the string cut with a knife; the nugget falls to the ground. Here is a sequence which our experience tells us is not only *irreversible* but also *invariable.*

The breaking or loosening of the thread never takes place without the object falling to the ground; the heavy object never falls to the ground as long as the thread remains fastened to it and entire. The full significance of this we shall see afterwards; in the meantime we note the different kinds of sequences.

Co-existence.

§ 145. Another relation of which we have an intuition is that of *co-existence.* We have already considered the part which this relation plays in originating our conception of space, and we need not recapitulate. We may here observe that our *perception* of external objects usually comprehends a complexity of relations of both sequence and co-existence. And further we remark that a relation of co-existence is a necessary condition of our being able to intuite the relations to which we shall next turn our attention.

Likeness and Unlikeness.

§ 146. The relation of *Likeness* and *Unlikeness* is a most important object of our intuition. We are able to compare two phenomena of consciousness or two more complex objects of our knowledge, and to know by an act of intuition whether they are like or unlike to one another. We use the words like and unlike in a comprehensive sense, including under them various kinds of likeness or unlikeness, of which the most important are the following:—

Equality.

(1.) The likeness or unlikeness which exists between two bodies *considered as occupying space* we call *Equality* or *Inequality*. Two lines being seen side by side we intuite as equal or unequal; and so of two superficies or two solids. There is another kind of likeness between superficial figures and solids called by mathematicians *Similarity*, and constituted by certain *proportions* existing between the different parts of the figures. This, however, is not an object of intuition, and with it we are not therefore at present concerned. But there is an inferior and vague kind of likeness which we intuite when we compare objects which have a more or less resembling figure or outline. As, for example, the general figure of one horse is somewhat like that of another, although there are many differences between them.

Likeness in kind.

(2.) There is a likeness or unlikeness perceived in the *Nature* or *Kind* of the objects of intuition or knowledge. One red colour we intuite to be like another, and to be unlike a blue colour. Any sensation of colour we intuite to be unlike any sensation of smell. And so of all objects of consciousness. The same intuition takes place with reference to complex objects of knowledge, and to parts of which they are composed.

In degree.

(3.) We are able also to compare in intuition the *Degree* or *Intensity* of objects of consciousness. There are many things agreeing in kind but differing in degree, and the perception of this agreement or difference in degree is, in the case of simple phenomena of consciousness, a matter of intuition.

Derived and complex relations.

§ 147. The relations to which we have referred in the preceding paragraphs appear to be those which are *primary*; but there are many other relations of which we usually speak which may be reduced to one or other, or some combination of the preceding. We speak, for example, of the relation between the sign and the thing signified; but this upon examination will be found resolvable into that of sequence. So also of the relation of cause and effect, using cause in its *phenomenal* sense. Again, when we say that an object *comprehends* certain qualities, as that a horse is vertebrated, we mean that there exist certain relations of co-existence or immediate sequence between the quality vertebrated and the other qualities which make up our conception or intuition of a horse. So of the relation of parts to a whole, and various other relations which might be specified.

§ 148. We must be careful to distinguish the use of *intuition* as described in this section from another employment of the word which seems not so appropriate. Some writers mean by intuition the knowledge which we have of certain first principles which are universally present in the human mind, and the belief of which springs up by a necessity of our nature, but in a way which we cannot explain. The universality, necessity, and inexplicability of a belief are the marks by which it is known to be an intuition. This use of the word appears to be objectionable. An *intuition* ought naturally to mean the act of *seeing* something directly, and therefore knowing it with certainty. Now there are many beliefs which are necessary and universal, such as the belief in some objective cause of the things which we know as constituting the natural world, which are the result of inference and not of intuition. And the so-called intuitions of the mind spoken of by some writers will probably be found in some cases capable of analysis into simpler elements.

SECTION III.

DEPENDENCE OF PREDICATION UPON INTUITION.

Predication not arbitrary.

§ 149. The connection of Predication with Intuition, is not an arbitrary or fortuitous connection. A certain intuition having taken place, the predication which follows from it may not be this or that or something else according to choice; but there are certain laws which govern us in founding mental assertions upon intuition. These laws may be very briefly stated and illustrated. We have before us various objects of intuition; they may be sensations, they may be objects of perception, they may be relations, or anything else immediately before consciousness. Let us indicate them by the first letters of the alphabet. We intuite the object A; it is *necessary* for us to predicate "this is A;" it is *impossible* for us to predicate "this is not A." This law of thought is usually known as the *Axiom of Identity*, and thus expressed: A is A, *i.e.*, *everything is what it is.* Again, we intuite a certain relation existing between A and B. Upon this intuition is founded the predi-

Law of identity.

Contradiction.

cation "A is B;" and it is *impossible* for us to predicate "A is not B." This is usually called the *Axiom of Contradiction;* and its formula is, *Predications opposed contradictorily to each other cannot both be true.* The one or the other must be false, and from the truth of the one follows the falsehood of the other. These two axioms express the nature of the dependence of predication upon intuition. They are simply an analytic statement of the principle that predication must in all cases be conformable to the intuition on which it is founded. Whatever is *given* in intuition must be *asserted* in predication; and it is a mental impossibility to assert the opposite of what is given in intuition. Or if the assertion be made in words, the mind refuses to acknowledge its truth.

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Test of truth.

§ 150. These two laws of the dependence of predication upon intuition furnish us with the ultimate test of truth. That predication which is exactly conformable to the intuition of which it is an expression must be *true.* Intuition is to us the only perfectly reliable source of truth. If we are immediately conscious of any object, it is impossible for us to doubt the existence of that object, because there is no more authoritative or reliable source of information than consciousness. When, therefore, we intuite any of these objects which, we have seen, are given in intuition, we are compelled to recognise them as existing as they are known; there is no room or no reason whatever for doubting. And when, from this intuition, the predication has been made according to the above-mentioned laws, we accept it as *true;* we cannot help it.

Errors in applying test.

§ 151. Notwithstanding the absolute certainty of this test of truth, if properly applied, a great deal of error has crept into human belief. Arising from the application of these laws, the error may have two sources; it may arise from supposing some mental act to be an intuition which is not really so; or it may arise from forming some predication which does not exactly express what is given in the intuition. As an example of the former we may take the metaphysical doctrine of *substance* or *substratum.*

It has been thought by many that the substance in which phenomenal qualities are supposed to inhere is made known to us in an act of intuition. But nothing can be farther from the truth; in itself it is admittedly absolutely *unknown;* and, in fact, it is only one of several *hypotheses* which have been invented for the purpose of explaining the existence and objective unity of phenomena. To connect substance with intuition is therefore to give to intuition an entirely different meaning from what we consider to be the correct one. Generally speaking, both of the sources of error to which we have referred are most prolific in connection with acts of knowledge of a *complex* kind. Where the object of knowledge is very complex, or where the mental act is the result of some *acquired* power, it is not easy to discover what are the simple original intuitions, and consequently there is abundant room for error. But when we have before us an object which we know is directly given to us in an intuition, and when the predication is made in accordance with the laws of truth, there is, to our minds, no possibility of doubt.

SECTION IV.

IMPLIED PREDICATIONS.

Explicit and implied truth

§ 152. There is such a connection and complication between truths that, generally speaking, when we know and express one truth there are many other truths implicitly known and ready to be expressed. In the predications which we make regarding the objects of our knowledge we give prominence to some particular feature which it suits our purpose to express, but there may be many other relations connected with the same objects which we know, which we imply in our predications, but which we do not care to state explicitly. Almost every explicit predication is connected with other implicit predications; in being distinctly conscious of the former we know the latter also, although they may not be so distinctly before consciousness. The explicit predication stands out clearly from amidst the surrounding implicit ones, but they are in the immediate neighbourhood and simply require the attention to be directed to them in order to make them as distinct as that which we have chosen to express. And it is frequently as important to know what is implied in our predications as to have a clear apprehension of what we distinctly state.

§ 153. A few illustrations will bring the subject more clearly before us.

Predications implied and excluded.

When we make the general predication—All men are mortal—we have in our minds the class of men as a whole wherever they are to be found, and we predicate regarding them that they are, without exception, liable to death. But in the very act of making this assertion there is involved the knowledge or belief that some particular men will die. In asserting a universal predication we imply its truth with reference to any particular number. The same kind of implication is involved of course in negative predications.

The Law of Contradiction is the expression of another fact regarding the relations of predications. An explicit predication not only *implies* other predications, but may also *exclude* other predications. The proposition above referred to excludes the corresponding negative—All men, or some men, are not mortal. And in the same way the predication of a universal or particular negative excludes the corresponding affirmatives. To know what a particular predication *implies* and what it *excludes* is the most important condition of *consistency* in our knowledge.

An important class of implicit predications is involved in the predication of the internal relations of an object or class of objects and its constituent qualities. Whenever we predicate a quality of any object we thereby implicitly classify that object with others possessing the same quality. When we say, for example, that birds are oviparous, we do not *say* anything about other oviparous things and we do not even *mean* anything about them, but if we examine the thoughts which cluster about the explicit predication we shall find amongst them that birds may be classified with other oviparous beings, if such exist. Were we to examine all other cases of *internal* predication we should find that each of them implies an *external* predication; whenever we predicate a quality of any object or class of objects we implicitly predicate that that object or class of objects may be included in a larger class, all of whose members are marked by the possession of that quality. This implied predication has also its corresponding *excluded* predication.

If we can assert that objects, in consequence of possessing a certain quality, may be classified with all other objects possessing the same quality, we are precluded from making this predication with reference to objects which do not possess the quality. And, generally speaking, where two predications are inconsistent with one another, if the one is either explicitly stated or implied, the other is thereby excluded.

Illustrated

§ 154. For the sake of illustration we offer the following examples of explicit, implied, and excluded predications :—

EXPLICIT *Predications.*	IMPLIED *Predications.*	EXCLUDED *Predications.*
All fishes oxidise their blood from water.	Some fishes, or these fishes, oxidise, &c. Fishes belong to the class of animals oxidising, &c.	No fishes oxidise, &c. Animals which do not oxidise, &c. are fishes.
All planets move in elliptic orbits.	Any particular planet moves in an elliptic orbit. The class of bodies moving in elliptic orbits comprehends planets.	All or some planets move in an orbit not elliptic. Bodies moving in a parabolic or other non-elliptic orbit are planets.
Whales belong to the class *mammals.*	Some mammals are whales. Some of the qualities possessed by all mammals are possessed by whales.	No mammals are whales. Mammals possess no qualities in common with whales.
Alfred Tennyson is a poet.	Alfred Tennyson possesses the genius and other qualities which constitute a poet.	Alfred Tennyson is wanting in poetical genius.
The angles of a plane triangle are either equal to two right angles or unequal.	If they are equal to two right angles they cannot be unequal, and *vice versâ.*	They may be both equal and unequal.
John Smith is a drunkard.	John Smith cannot control his appetite for strong drink.	John Smith can choose either to drink or not to drink strong liquor when he pleases.
The line A is double of B.	The line B is half of A.	The lines A and B are equal. The line B is greater than half of A.
The sun illuminates the earth.	The sun is luminous. The sun and earth are so related in space that light from the former can fall upon the latter.	The sun is neither a self-luminous nor a light-reflecting body. The earth is so situated that rays of light from the sun cannot fall upon it.

Having illustrated the relations between explicit and implied and excluded predications, we may sum up our results in the following canons:—

Canons of predication.

(1.) Whatever relation is predicated of a class of objects may be predicated of any individuals belonging to the class; the denial of this relation with reference to any or all of these individuals is excluded.

(2.) The predication of an internal relation of any class of objects implies an external relation, viz., that these objects belong to a larger class of things possessing the quality predicated. The denial of this and the assertion that objects not possessing the quality belong to the class are excluded.

(3.) The predication that an individual belongs to a class implies the possession of the qualities constituting the class. The contrary is excluded.

(4.) The predication of any external relation between two or more objects implies the existence of all the conditions which render that relation possible. The denial of these conditions is excluded.

(5.) Generally, the predication of any relation excludes the predication of all other relations which are inconsistent with it, and implies the predication of all relations which are its necessary conditions or consequences.

Errors in predication.

§ 155. Notwithstanding the fact that these principles regulating the implication and exclusion of predications are clear and certain, there are actually found many inconsistencies and inaccuracies amongst the thoughts of men. Predications are

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frequently thought to be implied which are not really implied, and thought to be excluded which are not really inconsistent with admitted truth. And it is the great duty of the instructors of mankind to spread abroad accurate and consistent knowledge, that is, knowledge in which established principles and facts are accompanied by everything implied in them and from which all inconsistent opinions are excluded. We may refer, by way of illustration, to some mistakes which are frequently made or have been made in determining the implication or exclusion of predications.

In judging of the national characteristics of foreign peoples, striking features are often erroneously supposed to be universal, and false judgments are consequently pronounced in particular cases. Englishmen are of the opinion that the Germans are a musical people, and it might be supposed that every particular German is a musician either actually or potentially. But such would be doubtless a mistake.

Europeans are of opinion that Bengalis are an untruthful people, and many of them in Bengal act upon the belief that the word of no Bengali is to be trusted. This is unquestionably an error. Bengalis, on the other hand, are of opinion that Englishmen are harsh and overbearing, and frequently apply this judgment indiscriminately. This is equally erroneous.

Defenders of the Jewish and Christian Scriptures maintain their accuracy and truth, and many of them think that it is implied that every statement must be accepted as literally true, and they will not admit any hostile criticism which results in disclosing any inaccuracies or inconsistencies. Believing that the Scriptures are true they think that if anything in them is shown to be inaccurate there is nothing worth preserving. They do not see that the presence of most important religious truth in the Scriptures is quite consistent with the presence of many scientific and historical inaccuracies and many inconsistencies amongst details. Consequently when they learn that inaccuracies or inconsistencies have been pointed out they fear that the citadel of their faith has been taken and that they can have no confidence in any religious truth whatever. The same foolish position is frequently assumed by the enemies of Christianity. Some of them appear to think that, if they have shown statements in the Scriptures to be scientifically or historically inaccurate or mutually inconsistent, they have demonstrated the falsity of Christianity, whereas in reality they have not approached the foundations of the Christian faith in their attacks.

Similarly, in former times, it was usual for the followers of rival creeds to attack with virulence subordinate details in the religious systems or Scriptures of their antagonists, thinking by so doing they were aiding their overthrow. And generally speaking, *sectarians* are those who are unable to see that there may be possessed great and important religious truth quite consistently along with many minor points of form or doctrine which they cannot agree with.

Apparent inconsistency of predications.

§ 156. In philosophical doctrines there may often be an appearance of inconsistence between two predications when in reality they are quite consistent. For example, Mr. J. S. Mill has endeavoured to show that Sir W. Hamilton's Doctrine of the Relativity of Knowledge is inconsistent with his Doctrine of Immediate Perception. In the former doctrine Hamilton maintains that we do not know things-in-themselves; in the latter doctrine, that we have an immediate knowledge of real things. Mr. Mill assumes that the things spoken of in the former doctrine are the same as the things said to be known in the latter, and upon that assumption rightly concludes that the one statement is inconsistent with the other. Now it appears to us that a careful examination of Hamilton's writings will show that Mr. Mill is incorrect in his criticisms, and that Hamilton in the two doctrines is speaking of two quite different things: in the Doctrine of the Relativity of Knowledge he teaches that the cause or substratum which underlies the objects of our senses is unknown; in the Doctrine of Immediate Perception he teaches that the objects of our senses are directly known; and between these statements there is certainly no inconsistency.

Again, there are many in the world who believe that God's will is sovereign, or that all events in their lives are controlled by Fate; and frequently they think that this implies that their own efforts in adverse circumstances are unavailing. They cannot reconcile the sovereignty of God with the importance of exercising all their own power and wisdom at all times as if they were sovereigns of their own lives. In consequence of permitting the idea of an over-ruling sovereignty to fill their minds to the exclusion of the idea of their own personal responsibility, when temptation or adverse circumstances come upon them, they yield without an effort and prove how helpless and worthless man is if he have not a lively sense of his own dignity and responsibility.

Sophistical reasoners in their attempts to mislead the people usually endeavour to show that opposing statements are quite consistent, or that really consistent statements are incongruous. And generally speaking it is of the greatest importance for seekers after truth to watch carefully appearances of incongruity; falsehood frequently comes veiled under the one, and truth is frequently concealed by the other. Doctrines apparently conflicting may frequently be comprehended harmoniously under a higher truth; and doctrines joined together in some human system may be as inconsistent as light and darkness.

SECTION V.

THE CLASS; THE CONCEPT; THE NAME.

Objects, how known.

§ 157. We have hitherto been concerned with individual objects of knowledge and the relations existing between them. We must now consider a mental process in which the individual objects that we know are variously joined together into classes. And it must be borne in mind that, in this connection, when we speak of *objects*, we mean not merely objects of simple intuition, but also objects or results of more complex mental processes, such as perception. Our knowledge of any object is made up of all the predications which we can form regarding it. Having perceived any object, we express our knowledge of it by predicating that it possesses such and such various qualities. And in the case of each predication we mean that the quality referred to in it exists in a certain relation to the aggregate of the other qualities contained in the other predications. Now, in considering any object of thought, we are able to restrict our attention to a limited number of the qualities of which it is an aggregate, to separate them in imagination from the rest and consider them by themselves. The qualities to which attention is thus exclusively given are said to be *abstracted* from the others.

Classes.

§ 158. The power of restricted attention being admitted, we further postulate an ability to *compare* different objects of knowledge with reference to the possession of abstracted qualities. Having a number of objects before us we can, by observation, ascertain whether they all possess or do not possess a certain quality or qualities to which we have given attention. If we find that they all actually possess this quality or these qualities we naturally attribute to them a kind of *unity;* we think of them as forming a *class;* we apply to them some common *name.* Thus the reason why we collect individual objects into classes and designate them by a common name is that we are able to predicate concerning them all some specified quality or qualities. Now, in this process there are three things to which we must give attention: first, the abstracted qualities; second, the class which has been constituted by virtue of the possession of these qualities; and third, the use and meaning of the name.

Concepts.

§ 159. In order that the process of generalisation may be possible, it is absolutely necessary that our attention should be restricted to *some* of the qualities of bodies; because amongst the bodies with which we are acquainted *variety* is uniformly to be found, and in order to reduce them to *unity* we must disregard the qualities in which they differ. Having, therefore, by observation abstracted certain specified qualities in the possession of which a number of objects agree, these qualities taken together form a kind of mental object; in the act of representation, although we may not be able to banish altogether all the other qualities of the bodies, yet we give to them peculiar prominence; we attribute to them a kind of separate existence, which, although no doubt objectively fictitious, is mentally real. These abstracted qualities thus mentally unified we call a *Concept.* Now the question arises, Upon what principle is it that we choose certain qualities of objects for abstraction and unite them into a Concept?

Formation of a concept.

§ 160. In answer to the question proposed, it is in the first place manifest that no qualities need be chosen except such as are possessed by all the objects concerned. If we can at all unite objects into a class it must be by means of something which they possess in common; some quality or qualities in which they all agree. Thus we have one principle at least to guide us in the formation of a concept. *Nothing can form a part of the concept which is not possessed by all the objects.* This principle excludes all those qualities with reference to which the individual objects *differ* from one another. Here again another question presents itself—Are all the qualities in which objects *agree* to be included in the concept? In order to answer this question we must consider the end for which generalisation is undertaken.

Common qualities.

Peculiar qualities.

§ 161. The reason why we collect objects into classes is that we may know them better. But in this connection, more complete knowledge does not mean a more perfect knowledge of the qualities possessed by each individual. Our knowledge of classes is made complete by our being able to compare them with other classes, and know in what respects they agree and in what respects they differ from them. Hence, when we wish to have an accurate knowledge of a class, it is not sufficient merely to collect into a mental unity all the qualities in which the objects of the class agree with one another; we must also consider in what qualities this class *differs* from other co-ordinate classes. The points of difference are manifestly of great importance, because it is only by these that there can be a distinction made between the class in hand and other classes. Thus we have two collections of qualities to be considered; those in which all the objects of one class agree, and those in which this class differs from other classes.

For the sake of clearness let us suppose,

$$\left.\begin{matrix} a\\ b\\ c\\ d\\ e\\ f \end{matrix}\right\}\left.\begin{matrix}\text{to be qualities possessed in common}\\ \text{by all the objects of the class}\end{matrix}\right\} \text{A, and } \left\{\begin{matrix} b\\ d\\ f\\ k\\ l\\ m \end{matrix}\right\}\left.\begin{matrix}\text{to be qualities possessed by all the}\\ \text{objects of the class}\end{matrix}\right\} \text{B}$$

Now if we formed our concept of the class A without comparing it with other classes, we should include in it all the agreeing qualities *a*, *b*, *c*, &c. But when we compare the two classes A and B, we find that they *agree* in the possession of the qualities *b*, *d*, *f*, and they *differ* in that A possesses *a*, *c*, *e*, which are absent from B; whereas B possesses *k*, *l*, *m*, which are absent from A. Consequently *for the purpose of distinguishing* A *from* B we must *reject* from the concept of A those qualities in which A *agrees* with B, viz., *b*, *d*, *f*; and we must *include* in the concept of A the qualities *a*, *c*, *e*, in which A *differs* from B. Thus for the purpose of distinguishing one class from other classes, special attention must be given in the formation of the concept to those qualities which constitute the *differentia* between it and other co-ordinate classes.

Formation of higher classes.

§ 162. Are, then, all the points of agreement between the class A and the class B to be rejected from the concept of A? If our object were merely to distinguish A from B we should reject them. But as we wish to *systematise* our knowledge, to bring all the classes of objects into relation with one another, the points of agreement between classes are manifestly of great importance. For if we consider as objects the lowest classes which we have formed, and observe the points of agreement between them, we shall be able to form a higher class, comprehending all these lower classes in the same way as they comprehend individual objects. And this process of classification may evidently go on until all the objects with which we are acquainted have been combined together by virtue of their possessing something in common. Now, in order to connect any particular class with this system of classes, it is necessary to know not merely in what respects it differs from other co-ordinate classes, but also by virtue of what qualities it is comprehended under a more general class. And these qualities, called *generic*, must therefore be united in the concept to the *differentia* before spoken of. Thus the concept of any class must comprehend the generic qualities, or those in which the class *resembles* other co-ordinate classes, and the differentiæ, or those qualities which *distinguish* it from these classes.

How to assign an object to its class.

§ 163. Having explained and illustrated the general principles of classification, we now proceed to study the process of assigning any particular object of our knowledge or thought to its appropriate class. To be able to do this correctly is a matter of great importance, as we do not know an object accurately until we know what class it belongs to. Before we can classify any individual it is manifestly necessary for us to know that it possesses the essential qualities of some class; having ascertained this we immediately assign it to that class. We see, for example, an object rooted to the soil, evidently organic, and having a stem, branches, and leaves. Knowing that these qualities are possessed by many vegetables, we assign our individual to that class. A further examination reveals the fact that the object has flowers growing upon it, that the leaves are netted instead of parallel veined, that it has a woody stem composed of a number of circular layers around a central pith. Knowing something of botanical classification we call our plant an *exogenous flowering plant.* Pursuing our examination into minute characteristics of the flower and the leaves and the seeds we succeed in determining the Order, the Genus, and the Species of the plant.

Thus it appears that all that is necessary in classifying an object is a knowledge of the characteristics of the class to which it is problematically to be referred, and a knowledge derived from examination that the object in hand presents these characteristic qualities. Having discovered the important qualities of an object we look about, unless we already know, for some class whose concept comprehends these qualities; and having found it we unite by a synthetic act the individual with the other individuals of the class.

Difficulties in classification.

§ 164. As long as we are dealing with inorganic elements or organic material bodies there are no great difficulties in the way of classifying individuals. We are now able to apply chemical tests with definite and precise results to all inorganic elements; and the microscope and dissecting knife enable us to examine the minute parts of organised objects with great accuracy. And consequently it only requires a certain amount of practical training and skill to refer any object with precision to its proper class. But when we come to the more complex relations of human life and action much greater difficulties present themselves. These difficulties arise from the greater complexity of the phenomena with which we are dealing, from the want of such a precise system of classification as we have with reference to material objects, from the impossibility of observing such clear distinctions as are seen between organic things, and from other causes. The following are some of the objects of thought in connection with human life and action which present themselves for study and classification :—The phenomena of consciousness; mental modes of action constituting character; bodily habits; languages; general forms of body and countenance; national customs and superstitions; family institutions; tribal habits and laws; forms and characteristics of governments; and other features connected with social life which will readily suggest themselves. A few illustrations will show the difficulty of reducing these things to scientific system.

Illustrated

§ 165. When we observe an action done by some person, we often experience a feeling of pleasure or displeasure, of approbation or disapprobation, and we judge that the action is either right or wrong. Now students of the human mind cannot agree as to what is the true nature of this moral feeling or judgment, as to whether it is primarily a feeling or primarily a cognition, as to whether it is a simple and original phenomenon of human consciousness, or a complex and derived phenomenon found only in human minds which have attained a certain degree of advancement.

Again, when we try to estimate the character of the men whom we meet there is room for great doubt and uncertainty. We sometimes observe men giving large sums in charity to the poor, or otherwise trying to ameliorate their condition; and we should probably think that these were *benevolent* men. But it is possible, and many times true, that men perform apparently benevolent actions from some selfish motive, and the discovery of this fact makes it impossible for us to classify them as benevolent. The motive by which an action is inspired constitutes the most essential element of the action, and the difficulty of ascertaining its character renders it difficult to characterise the action.

Suppose, again, that we wish to determine whether a certain writer is a poet or a philosopher, it is not in all cases easy to do so. There are versifiers who are not poets; and there are many who write about philosophy but are not philosophers. And critics are not by any means agreed as to what it is that constitutes a man a poet or a philosopher. Thus we have here a twofold difficulty; the essential qualities of the classes are not determined with precision; and even if they were determined it is no easy matter to say in any particular case whether a person possesses them. It requires a certain amount of poetical or philosophical genius to estimate the quality of poetic or philosophical writings. Students of language also find great difficulty in classifying the different languages of mankind. Leading distinctions have no doubt been observed and form the basis of a provisional classification, but the science is yet in its infancy, and much has to be done in the way of determining the characteristics of different languages and arranging them into a system. Similar remarks might be made with reference to most of the problems of classification which arise in connection with the intellectual, moral, and social life of man. And we may now point out a few leading errors which we are apt to make in our study of the phenomena in question.

Common errors in classification.

(1.) Errors are often made in failing to distinguish the essential or predominating character of that which we are examining. A man may conceal under a harsh and forbidding exterior a really kind and generous heart; the manner of a man is most frequently that by which he is at first judged; and thus people frequently form an erroneous judgment by not looking through the manner at the more essential qualities of mind and conscience.

(2.) Errors in classification arise from supposing things to differ which in reality are the same or similar. For example, Sir W. Hamilton supposed that Dr. Reid's theory of perception was quite different from and inconsistent with the representative theory held by Dr. Thos. Brown and others of Reid's predecessors. In truth, although there were minor differences, the essential doctrines of Reid's theory are not what Hamilton supposed, and are not so different from the doctrines of Brown as to entitle them to be put into a different class. Real resemblances are often concealed under a difference of phraseology, and it is an important function of thought to penetrate beneath the verbal expression of doctrines to the ideas taught.

(3.) Errors in classification arise from supposing things to resemble one another which are in reality different. Things indicated by the same word, for example, especially if the things indicated are mental in their character, are at first sight supposed to be the same, but in reality they are frequently found to be very different. Names, in the course of time, often change their meaning, and it is frequently very difficult to observe and discriminate the different meanings which, at successive times and as used by different persons, they carry with them. The philosophical name *idea* presents us with a good example of a word which means very different things as used by different writers or even by the same writer. Not only may single words mean different things, but also similar forms of expression may be very ambiguous in meaning; of this, good specimens are given in many of the ancient oracles which were usually susceptible of quite different interpretations. And the writings of sophistical reasoners are usually filled with forms of expression which convey one meaning to the mind of the reader, but are used to express quite a different idea of the writer's mind.

Essential and accidental qualities.

§ 166. There is a question of importance connected with the nature of classes now to be considered. Have classes only a *mental* existence? Have they an existence only in the *concept* by which the mind binds them together? If they have not, then one concept, provided it be constituted as we have shown it should be, will be just as good as another. If the differentiæ of a class are all duly observed, and included along with the accurately known generic qualities in the concept, these differentiæ and generic qualities being discovered only by the test of difference and agreement, the concept thus formed must be unexceptionable. But it is actually found that men of science, in constructing a classification, *select* from amongst all the points of difference and agreement certain qualities which they think to be of greater importance than others. They frequently *reject* from their definition of classes some qualities which by reason of agreement and some which by reason of difference should be included.

An illustration will make plain what we mean:

Fishes	Whales
a. live in water.	*a.* live in water.
b. are vertebrated.	*b.* are vertebrated.
c. obtain oxygen for their blood from the water.	*c.* obtain oxygen for blood by breathing air.
d. propel themselves by fins.	*d.* move by organs like fins.
e. are oviparous.	*e.* are viviparous.
f. have a long rounded figure fitting them for easy motion in water.	*f.* have a fish-like figure.

Now comparing the lists of qualities possessed by fishes and whales we see that the qualities marked *a, b, d,* and *f* are identical or very similar; while the qualities *c* and *e* are different. And the question is, Are we to include whales in the class Fish? The points of agreement are numerous. And if one quality were just as *essential* as another, we should probably come to the conclusion that a whale is a fish, as it was long believed to be. But men of science tell us that the points of difference to which we have attached the letters *c* and *e* are of vastly greater importance than such qualities as *a* and *f*; and they make these points of difference *essential,* and *some* of the points of agreement *accidental,* and consequently conclude that a whale is not a fish. Now upon what principle is it that the qualities *c* and *e* are considered essential and included in the concept of a whale, while the qualities *a* and *f* are not? How do you know the essential attributes of any class?

What constitutes essential qualities?

§ 167. A great variety of answers have been given to this question, and it would take us beyond our limits to enter upon a description or criticism of the different theories which have been held upon the subject. The determination of what are the essential qualities of classes is no doubt to be accomplished by a comparison of many objects and an extended observation of the relations existing between the qualities of objects. *Those qualities of objects which from their nature or uniform presence appear to determine a great many other qualities,* are naturally looked upon as being essential. The possession of *vertebra* by an animal, for example, must be considered an essential quality, because we observe that it is the ground upon which depend a great many qualities that distinguish a vertebrated from an invertebrated animal. The principles upon which the selection of essential qualities depends are, however, a matter of science rather than of psychology. But it is of importance to observe here that we have established the fact of the objective existence of natural classes of things. There is a reason in the nature of things themselves for their being brought together in classes. There are essential qualities comprehended in objects; and it is only when we make our concepts to comprehend the same essential qualities that we have an accurate knowledge of the objects. A concept is *true* only when it comprehends the essential qualities of the class from which it is derived.

Names.

§ 168. We now give some attention to the *names* which we give to the various classes of objects that we know. The study of the science of language has brought to light many interesting and important facts connected with the application of names to objects. The simple names which primitive peoples give to the objects of their knowledge are usually expressive of some striking quality possessed by the objects. A river, for example, may be called the *running* thing; the sun is named from its *shining* quality; the stars from *twinkling*, or perhaps shining. A name which is at first significant of some striking quality or action possessed or performed by an individual object is afterwards applied to other objects possessing a similar quality; and thus arises the first rude classification. Now, it must be observed that the name is attached to the *objects* individually; becomes so associated with them as to form, as it were, one of their qualities. And upon its first application the name expresses the *concept* which the name-giver had in his mind when he invented the name; that is, expresses the quality which, to his mind, was most striking, and therefore most important. But as knowledge increases the nature of the concept changes; other qualities of the object are discovered which are found to be of greater importance than those first observed; but no corresponding change takes place in the name. Thus the natural class and the name are *constant*, while the concept is *variable*. And the question arises, What is the psychological significance of the name?

Denotation and connotation.

§ 169. It is usual to say that a name *denotes* objects and *connotes* attributes; and it is usual to assume that the objects denoted are the objects of the class of which the attributes connoted are the essential attributes, that is, the concept. Now it is quite correct to say that the name denotes to all minds the objects of the class with which it has become associated; but it is not correct to say that the name connotes the attributes of the scientifically-formed concept. We have seen that the concept is a very variable mental object depending upon the knowledge and mental habits of the individual in whose mind it is formed. And, moreover, the concept is never represented in the mind without bringing along with it other *accidental* attributes forming no part of itself. And unless we arbitrarily restrict the connotation or meaning of a name, we shall hold that it connotes all the attributes essential or accidental which it is the means of bringing before consciousness. Thus it would be very difficult for any one to pronounce or hear the word *fish* without thinking of the quality *swimming in the water,* which is an accidental one. And it is in only a small number of minds that the sound of the word "fish" would suggest the quality of *water-breathing,* which is a constituent element of the concept. Thus we should say that while the *denotation* of a class-name is invariable, or varies only in consequence of some change in the class, its *meaning* is, in different minds, exceedingly variable, depending not only upon the variation of the concept, but also upon the introduction into the mental image of a variety of accidental qualities. In consequence of this variability of the meaning of names, scientific men have, to a great extent, ignored the ordinary names of common language, and invented a scientific vocabulary whose words should connote only scientifically-formed concepts. Thus the principle is recognised that, in a scientific interest, the names of classes ought not only to denote the classes, but also to connote exclusively the attributes of the concept. But it remains equally true that in the ordinary affairs of life the names which we use have a very variable meaning, but are used to denote something which is practically invariable, a really existing class.

General names and ideas.

§ 170. A great deal of confusion has been caused by the application of the epithet *general* to the names which have become associated with classes and to the ideas, as they are called, which we form of classes. It appears to be assumed that the result of the process of generalisation must be itself *general;* and the question has long been discussed, Where is the assumed *generality* to be found? Realists have held that there is a general idea existing in Nature; conceptualists maintain that generality is to be found only in the mental concept; nominalists contend that nothing but the name is general. The truth is, we might as well speak of a square circle or a green smell as of a general idea or a general name. Every concept which we form is an *individual* collection of qualities; every name which we utter is an *individual* sound. The name has become associated in our minds with certain similar objects which, in consequence of their similarity, we think of as forming a class. The concept consists of a number of qualities which we have observed to exist in all the objects belonging to the class. The name is predicable of all the objects of the class, and therefore, if we insist upon using the word general, we may say that the *application* of the name is general. The qualities of the concept are predicable of all the objects of the class, and therefore we may say that the qualities represented in the concept are generally or universally found in the class. And in fact it is the universal presence of the essential qualities in all the objects of the class which is the ground both of the general application of the name and of the formation of the concept. And, consequently, that which we mean by a name and that which we represent in a concept has a real existence only in the particular objects of Nature.

Definition.

§ 171. The exposition in language of the qualities of a concept is called *Definition;* the arrangement in subordinate groups of the objects denoted by a name is called *Division.* But it must be remembered that the definition is *accurate* only when the concept is *true.* For a definition to be correct it is necessary that the concept of which it is an expression should comprehend the essential qualities of the class; if the essential qualities are not known, if the class is recognised only by certain accidental superficial attributes, a correct definition is impossible, and we must be satisfied with such an indefinite description of the class as may be within our reach. The important point which we wish to bring out here is that a definition, to be correct, must conform to objective existence; that this conformity is brought about through the medium of a true concept; and that unless the concept correspond to real existence, a correct definition is unattainable. Division is a process the reverse of classification. As by the perception of mutual agreements we unite objects into classes, so by the perception of mutual differences we separate classes into subordinate groups.

Division.

The rules of both definition and division are given in logical works, and these rules assume that we are always able to *test* the accuracy of a definition or a division by means of intuition. By intuition, that is, by direct observation, the concept is formed and the class is determined, and when we attempt to *elaborate* concepts and classes into systems, it is only by reverting to intuition that we are able from time to time to test the correctness of our systems. The limitation of the sphere of logic, therefore, simply to the exposition of the nature and relations of concepts, without any reference to the *truth* of those concepts, is, judged from the pyschologist's point of view, a blunder. We are not satisfied with *consistency* amongst concepts which may be crude or erroneous or baseless; we must have our systems of science continually tested by a comparison with the truth of Nature, otherwise they are simply castles in the air. Consequently it is unwise to separate the sphere of logical thought from that connection with the real world which is afforded to it in the continually possible exercise of intuition.

SECTION VI.

PREDICATION AGAIN.

Predication described.

§ 172. We have seen that Predication is the mental assertion, expressed in language, that one object of thought stands or does not stand in a certain relation to another object of thought. We have seen the dependence of predication upon intuition, and the part which it plays in the formation of the concept. And before proceeding to consider the more complex processes of thought, it will be desirable to understand more fully the nature and kinds of predication in itself. Predication is founded upon a union in consciousness of the two objects of thought of which the one is predicated of the other. The union in consciousness may correspond to an external objective union, or it may not; but a subjective union there must be in order to render predication possible. The *terms* of the predication, the things between which the relation is affirmed to exist, are called *Subject* and *Predicate* respectively. Since a union in consciousness is a necessary condition of predication, it follows that any proposition whose subject and predicate cannot be thus united must be unmeaning or false. If we assert in words, "A circle is a triangle," and attempt to think together in consciousness the subject and predicate, we shall at once see that although a proposition has been constructed no intelligible predication has been made. There are, then, what we may call *impossible* predications; which are such that the mind is incapable of bringing together the subject and predicate into the relation which is asserted to exist between them.

Some unions impossible.

Accidental co-existences not joined in predication.

§ 173. Again, there may be objects of knowledge united together in consciousness, of which the one cannot properly be predicated of the other. For example, we may have in consciousness together the sweet smell and the red colour of a rose; but it would be absurd to predicate the latter of the former. The only way in which we can form a predication is to make one of these qualities a predicate of which the whole aggregrate of qualities, along with the name *rose*, is the subject. Thus, when we speak of objects of perception, we invariably make the complex objectified group of qualities the subject, and some one or other of the qualities the predicate. Now if we have in the same moment of consciousness a sweet smell and a red colour, it might appear just as reasonable that we should predicate the co-existence of these two qualities as the co-existence of one of them with the aggregate of qualities constituting the rose. But this is not so, and the reason appears to be that the aggregate of qualities has come to be looked upon as having more than a relation of co-existence with the single quality which is predicated of it. The aggregate of qualities is regarded as an *object*, a united-whole, of which the single quality is a constituent part. There is a permanent and indissoluble connection between the qualities which is not truly expressed when it is predicated of them merely that they co-exist with one another. And this permanent objective connection is the reason why the whole aggregate is usually made the subject of predication.

Classification of relations.

§ 174. From a careful examination of the nature of predication we have seen reason to conclude that it is the assertion that some relation or other exists or does not exist between certain objects of our thought. There are four great relations in one or more of which the phenomena of our consciousness must stand towards one another:—the relations of Difference, Resemblance, Simultaneity, and Succession.

If now, we consider the *objects* of our knowledge we shall reach another division of relations subordinate to the above. All objects which are related to one another may be distinguished into *quantities* and *qualities*. The latter correspond to the *sensations* of which we are or may be conscious; the former consist of the *Form* of sensations or objects, namely, the space, time, motion and so on, by which sense objects are conditioned. Again, the relations of all objects or classes which may be predicated are either *internal* or *external;* the former being the relations of objects or classes to internal constituent qualities or parts, the latter to other external objects or classes. Internal and external relations may be both quantitative and qualitative, and thus we have a fourfold division of relations into :—I., Internal Quantitative; II., Internal Qualitative; III., External Quantitative; IV., External Qualitative. This classification is founded upon and not exclusive of our former division of the four primary relations, as will be seen from the following table :—

I. Internal Quantitative Relations comprehend :—	II. Internal Qualitative Relations comprehend :—	III. External Quantitative Relations comprehend :—	IV. External Qualitative Relations comprehend :—
Relations of figure, size, shape, motion, number, and so on, of the constituent parts or elements of objects, classes or systems. These relations may be any of the four primary relations or any combinations of them.	Relations between the qualities of objects of our knowledge, or classes of objects, these qualities being made known to us by the sensations or ideas which they produce in our minds.	Relations of any of the four primary kinds or any combinations of them between the figure, size, shape, motion, duration, number, and so on, of objects, classes or systems which are external to one another.	Relations between external objects or systems with reference to qualities made known by sense, moral or æsthetical qualities, characters, habits, conditions and any other characteristics of objects of knowledge which may be appropriately called qualitative.

Illustrated

§ 175. We shall give illustrations of these great classes of relations.

I. Internal Quantitative Relations.

When we construct a geometrical figure, as that of the fifth or the forty-seventh proposition of the First Book of Euclid, we constitute a unity, and the subsequent demonstration is a comparison of the different internal parts in respect of their magnitude, and the inferences which result from that comparison. Similarly, many of the propositions of geometry consist of a combination of predications regarding the internal quantitative relations of different kinds of figures.

The astronomer who studies the motions of the different bodies belonging to the solar system is engaged with internal quantitative relations. The solar system as a whole constitutes a unity, the elements of which are the sizes, masses, distances, orbits, velocities, and so on, of the various bodies which revolve around the sun or the primary planets, and of the central luminary.

The mechanical engineer is similarly occupied when he arranges the figure, strength, motion, position, and so on, of mechanical structures, as houses, bridges, or machines. Comparative anatomists are able to complete the skeletons of animals, having given them certain of the bones. This ability is the result of careful study of the internal quantitative relations of the bodies of animals.

II. *Internal Qualitative Relations.*

The qualities of single objects of sense often require to be studied and compared in the interests of science. The chemist in his analysis of the various organic and inorganic substances which come under his notice is engaged in the study of internal qualitative relations. The process of classification involves a careful examination and comparison of the internal qualities of bodies or things classified. The composition and criticism of the productions of the poet, musician, statuary, and painter, consist chiefly of the arrangement and examination of internal qualitative relations. The same relations are the objects of study when we examine the characteristics of a man, of a nation, of a government, of a religious system, of a systematic body of doctrine of any kind, of an oration, in short of any of the vast variety of things known to us which are characterised by internal differences of quality or powers of exciting ideas.

III. External Quantitative Relations.

In classification, when the extension or quantity of one class is compared with that of another, we are dealing with external quantitative relations. Many geometrical propositions are concerned with these relations. Comparisons of the weights, masses, figures, proportions, velocities, numbers, and so on, of distinct bodies not forming parts of a connected system, have for their objects external quantitative relations.

IV. External Qualitative Relations.

The botanist, zoologist, and chemist, in comparing the different specimens of objects which come within their respective spheres of study are concerned about external qualitative relations. So is the ethnologist in comparing the characteristics of different races of men; the philologist in comparing the principles of different languages; the mythologist in bringing together the myths, legends, and folk-lore of different countries; and the comparative economist in studying together the different social and political institutions which have sprung up in different countries at different times. This study of the qualitative relations of things and systems has sprung into importance chiefly in modern times, and is a very powerful method of scientific discovery. In the comparative study of physical characteristics, of moral and social habits, of myths, of religious beliefs, of languages, of institutions, of laws, and of historical events, consists the only available effectual method of discovering the beginning and the principles of human progress.

Predication defined and illustrated

§ 176. Now all thought is concerned about some, or all or various combinations of the relations which we have just now classified; and the result of every comparison, as well as the expression of every relation, is a *predication* or a *proposition*. In the exposition of our own views, we shall use the former term; in the criticism of current logical doctrine we shall use the latter. *Predication,* we may thus define as *the assertion that one object or element of our knowledge or conception stands, or does not stand, in some relation to one or more other objects or elements of knowledge or conception.* In order that we may clearly understand the nature and forms of predication we shall study a few examples of it. And we shall begin with the study of examples of the predication of internal relations.

When we say, *this rose is red,* we affirm an internal relation of simultaneity or co-existence. The redness is a quality found co-existing with all the other qualities which make up our knowledge of the flower. The uniform and inseparable co-existence of these qualities causes us to think of them all as making *one object;* and when we say *this rose,* we mean by it the *one object* made up of all the qualities. The first term of the above predication calls up an image before consciousness; the second term is one of the elements of the image singled out for the moment for particular attention; the predication affirms that the element forms a part of the whole object, or co-exists with the other elements of it uniformly and inseparably.

The horse has four legs. This predication also affirms a certain internal relation of the object *horse.* The first term of the relation denotes a particular object composed of many parts and qualities. The second term of the relation expresses particular elements or parts of the whole object. The predication affirms a relation of co-existence of that regular and inseparable kind which constitutes the co-existing qualities into an *individual.*

All predications which we make regarding the internal constitution of objects are of the same nature as the above, and have about the same significance. The *form* of the predication is a matter of comparative indifference, as we are now engaged in the study of *thoughts,* not of *words.* The same relation is expressed by all the following forms:—The rose *is* red; the horse *has* four legs; the house *consists of* six rooms; England *contains* Middlesex; the lion *is possessed of* a shaggy mane; the solar system *comprehends* the sun, planets, and satellites. And in all these cases the first term of the predication denotes a whole object, and the second term expresses some quality, part, or element of the object.

§ 177. Not only may we predicate internal relations of material objects and systems of objects, but also of mental and social phenomena. The following are examples of such predications:—A moral judgment consists of intellectual and sentimental elements; the family is composed of a husband, wife, and children; the Government of England includes the Sovereign, the House of Lords, and the House of Commons. The meaning of the predication in all these cases is the same as before.

There are other predications of relations which may, perhaps, be called internal, but which should be distinguished from the above. These are predications of *intransitive actions.* We may give as examples of these:—The dog barks; the fire burns; the sun shines; the river runs; the wheels turn; and so on. In all these predications, and such as these, there is involved the idea of something *proceeding from* the first term of the relation. *The dog* *barks,* means a certain sound proceeds from the dog. *Fire burns,* means that a certain sensation is experienced after contact with fire. *The river runs,* means that a body of water occupies different places at successive times. *The wheel turns,* means that the different parts of the wheel successively occupy different positions. The first term of each of these predications denotes some object; the second term implies some sensation or action; and the predication affirms a relation of *succession* between the co-existing qualities of the object and the sensation or action predicated.

Predication of external relations.

§ 178. We now proceed to the examination of external relations of objects as affirmed or denied in predications, and, for the sake of convenience, shall consider indiscriminately quantitative and qualitative relations. And first amongst these we have relations of difference. A relation of difference, we have seen, is absolutely necessary to enable us to distinguish one object from another. If two objects are *exactly alike* in quality they must, at least, have different *spatial positions* to be distinguishable. Relations of difference are usually expressed by the comparative degree of the adjective which expresses the quality with reference to which two objects are compared. The following are examples:—Red *is brighter than* green. Lead *is heavier than* wood. The sun *is larger than* any of its planets. The conceptions of "Paradise Lost" *are more sublime than* those of "The Deserted Village." A child *is not so strong* *as* a man. A greyhound *can run faster than* a bulldog. The scenes of heaven *are more glorious than* can be expressed by language. The fruit of the pine-apple *is not the same as* that of the orange tree. In all these cases, and in others which might be adduced, we see that the two terms of the predication are the two objects compared; and the predication asserts that a relation of difference, in some particular respect, exists between them. The words which we have italicised in the above examples *express the relation predicated* between the two terms; and it is manifest that it is of no consequence which term of the relation comes first in the predication. The substitution of the second term for the first would simply involve a slight change in the *expression,* but no change in the *thought. Red is brighter than green,* is in thought the same as *green is not so bright as red.* And so of all the others. Frequently we have to express a difference between two objects which consists in the fact that, along with a certain resemblance, the one possesses qualities which the other does not. For example, the bat differs from the mouse in that the former has membranous appendages answering the purpose of wings, while the latter has not. The zebra differs from the horse in having a regularly striped skin. The whale differs from the most of the mammals in being an aquatic animal. In such comparisons as these it is not easy to adopt such an expression as will show the difference predicated so clearly as in the former cases; but the *thought* is equally simple. There are two objects compared; they are found to differ in a certain respect; and the predication affirms that they do thus differ. And, as before, it is of no consequence which term of the relation comes first in the predication; the thought is the same, whatever be the particular mode of expression.

External relation of resemblance.

§ 179. Amongst the external relations of objects, both in respect of quantity and quality, that of resemblance is of great importance. It is in consequence of resemblance in certain respects that we classify objects together and constitute them a unity. It is in consequence of resemblance between objects that we draw inferences regarding them. We are not now concerned, however, with these uses of resemblance, but only with the nature and expression of the predication of resemblance. Let us study some examples :—

This line *is of the same length as* that. These triangles *are all equal-sided*. This piece of lead *weighs* two pounds. In the first and third of these examples there is a comparison of *two* objects, and a predication that they resemble one another; in the second the predication of resemblance has reference to *several* objects. When the terms related to one another in a predication of resemblance are common names, there is always involved a comparison of several objects. For example, when we say, *horses have four feet*, we mean that all objects known by the term horse resemble one another in having four feet; here we predicate a relation of resemblance between all known or conceived individuals. And, as we said before, we imply that *each* horse has four feet—an internal relation of co-existence.

We often predicate resemblance between things which are not exactly alike, but yet sufficiently alike to be classified together. When we say *crimson is like scarlet,* we mean not that they are exactly alike, but that they are the *same kind* of colour, and thus distinguishable from blue or green. When we say that *the sheep resembles the deer,* we mean to predicate resemblance only in certain respects, and if we state our meaning fully we will particularise the points of resemblance. The most of the resemblances which are affirmed in predication are only partial; when we affirm a complete resemblance we call it an identity, an equality, or some such name.

Although mental phenomena and material phenomena are thought to be entirely different in kind, yet they are frequently employed to illustrate one another. We speak of a *lofty thought,* thus implying a resemblance between the excellence of the thought and the altitude of some material object. We use *light* as a symbol of *truth,* or we say that *light resembles truth,* although there is in reality no resemblance whatever between them in themselves; but in their results there is a resemblance since the appearance of light and the imparting of truth are both productive of knowledge in the mind. The relation between a symbol and that which is symbolised, between a sign and that which is signified, is usually either a direct resemblance between the two things, or is accompanied by a resemblance amongst some of the circumstances or results connected with the two things. Sometimes, of course, this is not so, as in the case of the relation of a word to that which is denoted by it, where there is now often no resemblance, although there is reason to believe that originally the application of names was founded upon resemblance.

And of simultaneity and succession.

§ 180. The relations of simultaneity and succession between mutually external objects are often the subjects of predication. As when we say: Milton *was a contemporary of* Cromwell; John and James *were class-fellows*; soldiers on parade *keep step with one another*. Or when we say: Chaucer *preceded* Spenser; *after* the flash of lightning a loud peal of thunder *was heard;* a cause *is always followed by its* effect. It will be observed that the same relation of simultaneity or succession may be expressed in many different ways; and so far as *thought* is concerned, it is of no consequence by what words the relation is indicated, provided only it be indicated clearly. It will be observed, too, that the order in which the objects said to be related occur in the predication is immaterial. The sentence, *Chaucer preceded Spenser*, is the same as *Spenser followed Chaucer*. The predication consists in asserting that a relation of succession exists between the two individuals, specifying which comes first. And, with reference to all the other examples, it will be admitted that the form of predication is unimportant, provided only that it be clearly expressed what objects are related to one another and what is the relation between them.

Complex relations.

§ 181. We have hitherto confined ourselves as closely as possible to *simple* relations of difference, resemblance, simultaneity, and succession; but in the great majority of predications the relations predicated are more or less *complex;* and often the relations *implied* in a predication are more numerous than those which are expressed. We may give examples of such complex relations.

The judges in session, having tried the prisoner, agreed to find him guilty. In this complex predication many relations are expressed and implied. The judges *sit simultaneously upon* the bench—a double relation of simultaneity—(1) amongst the judges; (2) between the judges and the bench. *Having tried the prisoner*, expresses a continuous process and implies a multitude of relations; it also indicates that the action next asserted *followed* the trial. *Agreed to find him guilty;* here is expressed a relation of agreement amongst the legal opinions of the judges, and a relation of difference between the action of the prisoner and some law.

John struck the table. In this short sentence there are implied several relations. John and the table are in point of time *simultaneous*, in point of space *contiguous;* and contiguity is itself the result of the combination of several relations. The *stroke* of John is an *action*, and therefore involves *succession*, *viz.*, first the arm is raised; then it is gradually lowered, occupying successively different positions; and then it comes into contact with the table producing, probably, a sensation of sound and certainly one of touch. Thus this simple sentence predicates a complex series of relations between two objects, John and the table.

Many other examples might be given of complex relations being predicated between two or more objects; and it would be a useful exercise in the analysis of thought for the student to examine and separate the relations expressed or implied in the sentences which he reads. We think it will be found that *all relations* may ultimately be reduced to the four simple ones which we have described; and that all predications may be shown to consist of an assertion or denial, that one or more of these relations exists between two or more objects or elements of knowledge or conception.

Logical doctrine of the proposition.

§ 182. We have given and illustrated what we believe is a correct exposition of that most important act of thought which we call predication. It now remains for us, from the stand-point which we have endeavoured to establish, to take a view of the current logical doctrines regarding the proposition. These doctrines are found in all the smaller text-books of logic; and they find a place also in many of the more elaborate expositions of logical science. Not, however, in all, for we observe decided tendencies towards a departure from the traditional doctrine of the proposition in some modern writers

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of distinction. The leading features of the traditional doctrine are the following :—

Every proposition consists of *two terms* and the *copula.* The terms represent either concepts, classes or individual things; and the copula serves as the connecting link between them. The words which constitute the copula are *is* and *is not,* according as the one term is to be affirmed or denied of the other. The first of the two terms, that about which the assertion is made, is called the *subject;* the second, that which is asserted or denied of the first, is called the *predicate.* The subject of universal propositions is said to be distributed, or applied to all the things denoted by it; that of particular propositions is not. The predicate of negative propositions, being altogether denied of all the individuals denoted by the subject, is distributed; that of affirmative propositions is not. The copula is simply the sign of the relation of the two terms to one another; it must not indicate the actual objective existence of the relation or the things related, nor the time when the relation existed, nor the degree of certainty with which the assertion is made. All these accidental things must be included in the predicate. It is always possible, after limitations and changes in the predicate or copula, to *convert* propositions, that is, to put the predicate in place of the subject, and the subject in place of the predicate; and this conversion, being rendered necessary by the laws of the *syllogism,* is an essential part of the doctrine of the proposition. These are the principal points in the doctrine of the proposition regarding which writers upon logic are agreed; but there are some points about which they are not agreed. They are not agreed as to the *character* of the *predicate,* some maintaining that it may be either denotative or connotative, others that it is connotative only. Those who believe that it may be denotative are not agreed as to its *quantification,* some holding that its extent should be explicitly stated in the proposition, others that its quantity should be determined by the ordinary rules. They are not agreed as to the *meaning of the predication,* some holding that the subject and predicate are simply asserted to be two different names of the same thing; some that the predicate consists of attributes asserted of the subject; and some that a relation of mutual co-existence or mutual inclusion or exclusion or congruence or confliction between the two terms is asserted. These differing views may be referred to in the following criticism; but we shall give the most of our attention to the foregoing doctrines which are generally agreed upon.

Criticised.

§ 183. For the sake of clearness we divide the subject of our criticism into the following parts:—(1) the terms of the proposition; (2) the relation between these terms as expressed by the copula; (3) the doctrine of distribution; (4) the doctrine of conversion.

Terms.

(1.) In examining the terms of the proposition our principal aim will be to ascertain whether they correspond with the terms of predication. All predications, we have already shown, consist of the assertion or denial that one or more objects or elements of knowledge or conception holds some specified relation to one or more other objects or elements of knowledge or conception. All predications have, therefore, two terms related to one another, and the assertion of some relation existing between them. And we have to inquire whether the terms of the proposition, as described by logicians, are the same as the terms of the predications which we consciously make. In every proposition, put into logical form, the predicate must comprehend all the elements of time, mode, and action, which are usually expressed by verbs and adjectives or adverbs. A few examples of propositions may form a good basis for our criticism.

Horses are vertebrated. In this predication we affirm that each of a class of individual things possesses a certain quality or rather a certain part called a vertebra. Two objects of thought are before consciousness, the image of a horse or horses and that of a vertebra; and we affirm that the latter constitutes a part of the former. Thus we here assert an *internal* relation between the two terms; and this internal relation is correctly expressed by the word *are*. Neither can there be any doubt that the terms of the proposition correspond to the terms of the conscious predication. But, suppose we modify the proposition, and assert that *horses* *belong to the class of vertebrata,* it appears manifest that the predication which we make is quite different from the former one. Instead of predicating an *internal* relation we now predicate an *external* one; we assert that the class of horses are included in a much larger class of vertebrated animals. In the former proposition we do not think of any other animals except horses; in this proposition we must think of other animals constituting a large class which includes horses. Now the scholastic doctrine of the proposition teaches that the predicate *vertebrated* is either connotative or denotative, and thus fails to distinguish between the two important kinds of predications above illustrated. This ambiguity in the meaning of the predicate in such propositions should not be recognised either in psychology or logic; a predicate should mean either one thing or another, and the mode of expressing it should indicate which meaning is intended to be conveyed.

Again, *the sun illuminates the earth.* In this predication we have in thought two objects which are the terms of the predication, and a certain relation existing between them, namely, that light proceeds from the first to the second and thus makes its surface visible to our eyes. This proposition when put into logical form becomes, *the sun is a-body-which-illuminates-the-earth.* There the subject is *the sun,* and the predicate is *a-body-which-illuminates-the-earth, i.e.,* the sun again, along with its relation to the earth. Now we think that an appeal to consciousness will show clearly that the terms of this proposition, after being put into the logical mould, do not correspond to the terms of the predication which we consciously make. The two objects which we think of as related are, plainly, the sun and the earth, *not* the sun and a-body-which-illuminates-the-earth. And it should, therefore, appear that the so-called logical form of this proposition has no foundation in the facts of consciousness. *Gold is heavier than iron.* Here we have the image of two substances before consciousness, and we assert a certain relation between them, namely, that the one substance is heavier than the other. But according to scholastic doctrine, the predicate of the proposition is not *iron,* but *heavier-than-iron.* In this case also an appeal to consciousness will show that the second term of the predication, said to be in a certain relation to the first, does not correspond to the predicate of the logical proposition.

Many other propositions might be adduced which would show that in the majority of cases the terms of the logically-formed proposition do not correspond to the terms of predication which are thought of in consciousness as related to one another. We have seen and admitted that, when a proposition expresses an *internal* relation of an object or class to some of its constituent parts or elements, the scholastic proposition may be correct and adequate. But, when *external* relations are predicated between objects, the logical proposition is quite inadequate to their expression; the terms of the proposition do not correspond to the terms of the predication.

The relation predicated.

§ 184. (2.) We now consider the relation itself predicated between the objects or elements compared. Is this relation accurately expressed by the logical copula? According to logical doctrine the relations expressed by the copula are those of genus, species, difference, property, and accident; the predicate of a proposition may stand to the subject in any one of these relations. The two first of these are external relations; the remaining three are internal. Now it is manifest that these relations have all reference to the process of *classification;* and it appears equally manifest that there are a multitude of other relations which form the subjects of predication that have no reference to classification whatever. When we say, for example, *lightning precedes thunder,* we do not mean to classify either lightning or thunder with any other phenomena whatever, nor have we in our mind any fact or process involved in classification. We do not mean that the fact of lightning preceding thunder is a differentia or a property or an accident of lightning, or that that fact distinguishes lightning from any other phenomenon. We mean simply to assert that a certain phenomenon, lightning, usually or always, is observed, before another phenomenon, thunder, is heard. And this relation of antecedence or succession is certainly not expressed by the copula. Again, when we say, *elephants are quadrupeds,* these words properly express an *internal* relation between the animals spoken of, and the quality indicated by the predicate, the possession of four feet. But if this proposition is made to mean, *elephants belong to the class of four-footed animals*, we have an *external* relation asserted, and the copula is not adequate to its unambiguous expression. In the same way it might be shown that all the other external relations of difference, resemblance, co-existence, and succession, and their various combinations, cannot be expressed by the copula. In fact, logicians do not pretend that they can, because they always consign the expression of these relations to the predicate, thus playing false with the phenomena of consciousness and producing monstrous forms of language. It appears then, that psychology offers no foundation for the doctrine that the copula is the only proper expression of the relation between the terms of predication; and it might also be shown that there is no foundation in language. In many languages which are unquestionably expressive of thought there is found no such abstract verb as our *is*. And, even in our language, the substantive verb requires to be divested of all its meaning before it is fitted for logical use. Thus, it comes to be but an empty symbol, which differs from the symbols of mathematics, in that while each one of *them* has a definite meaning and represents a relation in thought, *it* is introduced for the purpose of putting aside the relations thought of which it cannot express.

Distribution of terms

§ 185. (3.) The doctrine of distribution is manifestly founded upon facts connected with classification. In the classes which we construct of organised individuals there are some qualities which are found in all the individuals denoted by the class-name; there are other qualities, called accidental, which are found in some individuals but not in others. We are able, then, to predicate that *all* the individuals of the class possess the former kind of qualities, but only that *some* of them possess the latter kind of qualities. Again, when we predicate an external relation of certain objects, as when we say "birds belong to the class of oviparous animals," it is evident that we speak of *all* birds, but only of *some* oviparous animals; and in this case the first term of the predication is distributed, the second not. But if we say "birds do not belong to the class of quadrupeds," we speak of all birds and all quadrupeds, and assert that the one class is altogether excluded from the other. In this case both the terms of predication are distributed. Thus, when the first term of the relation denotes a class, we indicate its distribution by prefixing the words all or some. When the second term denotes a class of greater extent than the first, we naturally indicate by the form of the predication whether we speak of all or some of the individuals belonging to it; and at least the accurate expression of thought demands that the distribution of both the terms of the relation should be unambiguously expressed.

These principles of distribution, properly applicable only to terms which denote classes, are applied by logicians to all kinds of terms and all kinds of propositions. All universal propositions distribute their subject, while particulars do not. All negative propositions distribute their predicate, while affirmatives do not. Now if we had not a particular system to maintain, it might appear plain to us that the principles of distribution cannot be, without absurdity, applied to anything which does not admit of distribution or non-distribution. If we say, for example, "the Duke of Wellington is a man," neither the first nor the second term of the predication is a class-name as here used; and were it not that we import from the process of classification, ideas foreign to the subject in hand, we should never think of the distribution either of "the Duke of Wellington" or "a man." Logicians, however, must reduce every proposition to the normal form, and so they make this a universal affirmation and write it "all of the Duke of Wellington is one of the class—man."

not always thought of,

and its laws not always applicable.

Again, if we take a proposition expressive of an internal relation, we shall see that the rules of distribution are not applicable. In the proposition "roses are sweet-smelling," the first term of the predication may denote either all or some roses according to our opinion of their odour. But the second term "sweet-smelling" expresses a *quality* possessed by roses, and when we speak of a quality, we surely mean the whole of the quality, and it seems absurd to say that the name of the quality is either distributed or not distributed; if we do so, we apply a distinction to it which is plainly not applicable.

This objection, however, is got over by changing the predicate and thus forming *another proposition*, thus:—"Roses are sweet-smelling flowers," meaning "roses belong to the class of sweet-smelling flowers." But it is surely objectionable, in order to get a proposition into such a form that the rules of distribution may be applied to it, *to change the relation* predicated in it. This proposition in its first form asserts an *internal* relation to the second term of which the principles of distribution do not apply; and in order to bring it into such a form that the second term may be tested by the laws of distribution, it is changed so as to express an *external* relation. Surely a correct psychology offers no foundation for such a procedure.

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It could be easily shown that the laws of distribution are inapplicable to many other kinds of propositions, of which we may give the following as examples:—The line A is equal to B; the sun is brighter than the moon; the dawn precedes the day; silver is not so valuable as gold; the Prince of Wales shot an elephant; stars bespangle the sky. In all these propositions relations are predicated between two or more objects, the relation being expressed with perfect clearness, and in none of them can we say, with any degree of appropriateness, that either term of the relation is distributed or non-distributed; the distinction is inapplicable and foreign to the subject.

Our conclusion, founded upon an examination of the meaning of propositions, may be thus stated. Only those terms which denote classes of things can be properly spoken of as being totally or partially distributed; the names of single qualities or objects should not be quantified; but wherever a class-name admitting of quantification should, for the sake of clearness, have its quantity made known, we have a right to insist that its quantity should be explicitly stated. This conclusion is founded upon the great law of expression,—whatever is contained in thought should be accurately expressed in words; whatever is not contained in thought should not be expressed in words. We do not *think* of the quality affirmed in the predicate of a proposition as being applicable to many or few objects; we should not therefore quantify it. But where the subject or predicate is a class-name, wholly or partially distributed *in thought*, its distribution should be expressed *in language*.

Conversion.

§ 186. (4.) We now come to the doctrine of conversion. For the sake of the transposition of terms required by the syllogism, it is considered by logicians of importance, that all propositions should be convertible; and there are certain well-known laws laid down for their conversion. The laws of distribution receive their full importance only in connection with conversion; as the importance of the laws of conversion is seen only in relation to the syllogism. The great law of conversion is,—that no term should be distributed in the converted proposition, which was undistributed in the original one. And by the application of this law it is found that universal negative and particular negative propositions may be converted without any change of quantity or quality, that the universal affirmative can be converted by limiting the quantity of the predicate, and that the particular negative may be simply converted after changing its quality, that is, changing it into a particular affirmative by transferring the sign of negation from the copula to the predicate.

Now, if we examine predications as they are naturally expressed, there does not seem to be any objection to the order of the terms being changed provided there is a sufficient reason for the change. If we say "whales are included in the class mammals," we mean the same as "the class mammals includes whales." If we say "thunder succeeds lightning," we are understood no better than if we say "lightning precedes thunder." The predication "gold is heavier than silver," expresses the same relation as "silver is lighter than gold." The sentence "John strikes the table," is, as far as thought is concerned, exactly the same as "the table is struck by John." In short, if we express any relation in a predication, the laws of thought and language require nothing more than clearness and accuracy in the expression; and it is a matter of indifference which term of the relation comes first.

But, if we examine the conversions of *logically* *formed propositions,* we cannot so easily admit their legitimacy. The proposition "roses are red," becomes, in the hands of logicians, when converted, "some red things are roses." The simple sentence "thunder succeeds lightning" is metamorphosed into "a class of things succeeding lightning is thunder." The monstrous forms of language which require to be introduced for the purpose of converting the majority of logically moulded propositions appear to afford a strong reason for doubting the legitimacy of the process. But, as we have seen, the principal objection does not lie against transposing the terms of a predication, but rather against the changes to which naturally expressed predications must be subjected, in order to bring them into the so-called logical form.

Consistency of predications.

§ 187. There are certain things connected with the mutual *consistency* of predications to which we now turn attention. Predications having the same subject may be related to one another in a variety of ways. The subject may be taken in its whole extent or only in part of its extent; the predicate may be affirmed or may be denied of the subject. Combining these different forms we get the contrary, contradictory, and subaltern relations of predications pointed out in works of logic. And it is necessary in combining predications together in a course of reasoning that *consistency* between the different predications made must be maintained. To be consistent is to avoid contradiction, and a simple inspection of two simple propositions will show whether they are contradictory or consistent. If we can predicate either of the whole or of some of the class A that they are B, it would be inconsistent to predicate that all are not B. If we can predicate of the whole or of some of the class A that they are not B, it would be inconsistent to predicate that all are B. But we may consistently predicate of some of the class A that they are B, and of others that they are not B, provided that B is not an essential quality. Further, inconsistency may arise from attaching predicates which are in their nature inconsistent with one another to the same subject; as, for example: The figure A is a square. The figure A is a triangle. But there may often be an apparent inconsistency arising from the attachment of incongruous predicates to the same subject, which is found to be not real. The incongruous predications may be truly made of different parts of the thing denoted by the subject. Inconsistencies between propositions are usually concealed by placing them wide apart in the discourse, by complicating them with many other propositions not clearly arranged, by the use of ambiguous terms, and in other ways. The avoidance and the detection of inconsistencies cannot be assisted to any great extent by special rules, but depends chiefly upon the clearness of intellectual perception, the correct and un-ambiguous use of language, and the avoidance of complexities and confusion, both in the individual parts and the general arrangement of the discourse in hand.

Law of excluded middle.

§ 188. With reference to the mutual relations of predications it is frequently of importance to place a doubtful question in such a form that either one or the other of two answers must be accepted as true. This is done by means of contradictory opposition. If "all A is B," it is perfectly certain that the predication "some A is not B" is false. If the latter is true, the former must be false. And there is no middle predication possible. The principle according to which we affirm that of two contradictory propositions the one must be true and the other false, is called the "Law of Excluded Middle." In the application of this Law we are, as a rule, not supposed to know which of the contradictory extremes is true, because if we knew, the proposal of the alternative would be useless. The law is frequently very useful in controversial argument, enabling one to place before an opponent two contradictory propositions, the one or the other of which he must admit to be true, and thus involve him in what is called a dilemma.

SECTION VII.

REASONING SIMULATING INFERENCE.

Importance of systematic knowledge.

§ 189. It is of great importance to human welfare that the knowledge which men possess should be clearly arranged in their minds, that the different elements of that knowledge which have a natural relation to one another should be brought together, and that ignorance and confusion should give place to systematic science. There may be possessed by a man a great deal of knowledge which can be of no use whatever in consequence of inability to bring together into one view related facts, to see their significance, and to give them their proper place in the system of knowledge. Thus the knowledge which many possess, although very extensive, is a perfect chaos, a jumble of confusion, and of no practical use in the guidance of life. To reason with a man frequently means nothing more than to point out the relation between different things which he already knows, and thus bring into order what was before confusion. There are to every man hundreds of "open secrets," facts related in particular ways which relations he cannot see, and it is the function of what is commonly called reasoning to convert this chaos of confused facts into a cosmos of order and harmony, so that men may see clearly what has always been under their eyes, and understand clearly the relations and significance of what they have blindly perceived. This discovery or pointing out of the true relations between things already known is not what we mean by Inference, although it very often assumes the form in which true inference is naturally expressed. It is made also still more closely to resemble inference by being frequently forced by logicians into the artificial forms of the syllogism, which is assumed to be the universal type of reasoning. To make clear the true psychological nature of the process which we are describing we shall examine some typical examples of it.

Erroneous classifications.

§ 190. We observe, in the first place, that mistakes are very apt to be made in the classifying of the objects with which we are acquainted, and a great deal of what passes for reasoning is simply an attempt to assign objects to their proper classes. There are many popular classifications which are erroneous in themselves and lead to other errors, and an important duty of scientific men is to correct these erroneous classifications. From our study of the formation of classes we can understand the manner in which a correct classification is to be effected and an erroneous one is to be avoided. It is only by the possession of the Essentia of a class, or at least of some universal characteristic of a class, that any object is to be referred to that class. Suppose, for example, that a person ignorant of natural history were to assert that whales belong to the class *fish,* his mistake would be corrected by informing him that whales do not possess the essential qualities of the class, fish,—they are not water-breathing or oviparous. Supposing him to know the principle of classification, he would immediately see that his predication regarding whales was incorrect. And upon discovering or being informed further that whales are viviparous and suckle their young, and that these are the essential qualities of a class called *mammal,* he would at once refer them to that class. Thus in order to effect a correct classification it is necessary to know by observation or instruction (1) what are the essential or characteristic qualities of some class in question; and (2) whether the object in question possesses or does not possess these qualities or characteristics. Knowing these two things, the mind at once refers or does not refer the object in question to the specified class.

The syllogism not the best form for correcting false classifications.

§ 191. The preceding example which illustrates the process of classification, when put by logicians into their favourite form of the syllogism, appears as follows:—

All fishes are oviparous animals:
Whales are not oviparous animals,
∴ Whales are not fishes.

We have already pointed out that the predicates of propositions, as a rule, are connotative,* and that, therefore, it is psychologically incorrect to give them extensive quantity. The first two of these propositions therefore ought to be:—

All fishes are oviparous:
Whales are not oviparous.

But these two propositions being taken together, it becomes impossible to classify whales with fishes, and consequently the mind asserts,—Whales are not contained in the class, fish. Now it must be observed that this is not an inference in the proper sense of that term. The so-called conclusion is directly *seen* the moment that the essential qualities of whales and fishes become known. If a boy have before him a number of marbles, and mixed up with them a number of hazel-nuts, he *sees* at a glance that the latter should not be classified with the former. The only difference between this case and the previous one is, that the qualities which make it impossible to classify the two sets of objects together are more obvious.

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* *i.e.* When the propositions relate to some facts of classification.

Incongruous predicates.

§ 192. Again, it is a principle of consistency between predications that two *incongruous* predicates cannot be attached to the same subject. To assert "the figure A is a square," and "the figure A is a circle," is a mental impossibility; and in practice the only difficulty is to see what predicates are incongruous, many predicates being frequently supposed to be incongruous which are not really so, and *vice-versâ.* Now much of so-called reasoning is nothing more than an attempt to show the congruity or incongruity of predicates. Suppose, for example, we take the proposition, "the sensualist, being enslaved by his appetites, cannot be free." When placed before our minds in this form there appears no difficulty in *seeing* immediately that "slavery to appetites" and "freedom" are incongruous, and cannot be predicated of the same individual. Logicians, however, must express it in the form of a syllogism,

> No one is free who is enslaved by his appetites:
> The sensualist is enslaved by his appetites,
> ∴ No sensualist is free.

We leave it to the reader to decide which is the most intelligible form.

Sometimes predicates are thought to be incongruous which are not really so, and the way in which this error can be most easily corrected is to point out an instance in which the apparently incongruous predicates are plainly seen to be consistent. It might, for example, be supposed that certain modes of conduct which are *consistent with holiness* cannot at the same time be *inexpedient.* This hasty judgment would at once be seen to be incorrect by pointing out some special circumstances in which it would be highly inexpedient to do some things which, after all, were quite consistent with holiness. But logicians would think that the simple pointing out of an instance to the contrary would not be enough to correct the error, and they would probably express themselves in some such way as this :—

> Some practices which the Divine Law allows are in some circumstances inexpedient ;
> All such practices are in themselves consistent with holiness :
> ∴ Some things in themselves consistent with holiness are in some circumstances inexpedient.

Popular reasoning often not inference.

§ 193. Many other examples might be given of the manner in which erroneous classifications are corrected, and the consistency or inconsistency of attributes or predicates determined. In popular language these processes are called reasoning, and logicians, basing much of their science upon this popular phraseology, do violence to psychology as well as to grammar by forcing them into the form of syllogisms. But in truth they are nothing more than the bringing together of related facts, and the perception of the relations between them. This being done, the so-called conclusion is not an unknown thing; it is directly seen. And the preliminary process is only the bringing of facts together so that it may be seen. Notwithstanding that this arrangement and harmonising of things known does not partake of the nature of inference, it is most important to human advancement and welfare that it should be well done. But the details of its accomplishment cannot be controlled by any rules more special than those general principles of classification and consistency to which we have referred. The work must depend chiefly upon the practical good sense and insight of the individuals who devote themselves to it.

SECTION VIII.

INFERENCE.

Character of inference.

§ 194. We have already seen that Inference is one of the two grounds upon which predication rests, the other being Intuition. And the difference between the two is this, that whereas in intuition we *see directly* the relation which is asserted in the predication, as well as the objects between which the relation exists, an inference asserts a relation which is not directly known, but which follows more or less immediately from what is so known. In our study of perception we have had under our notice many instances of inference. When we see an orange before us, we infer, or at least we may do so, that if we cut open the skin we shall see and touch certain small rounded elongated bodies called seeds. The reason why we infer this is that all the oranges which we have previously opened have had seeds of this description within them. And, judging from our past experience, we infer that this particular orange which we see before us has seeds within it. Now the nature of this simple inference is essentially the same as of that wonderful illustration of the power of reason exhibited in the discovery of Neptune. An inference is a mental assertion regarding the existence and relations of something not directly known, or, it may be, of something which we cannot directly know. And on the other hand, all inferences must be founded upon something which we do know, either directly or indirectly.

Sufficient Reason.

§ 195. The Law of Sufficient Reason gives an important caution regarding the drawing of inferences. "Infer nothing," it tells us, "without a Sufficient Reason." The statement of this law implies that inferences cannot be made arbitrarily, that before the mind can draw an inference there must be some antecedent reason to justify it. This principle is a universally binding one. But when the law tells us that the reason must be *Sufficient*, there is left a very wide margin for doubt and difference. All who draw inferences, and they include the whole human race, think that they have reasons sufficient for the inferences which they draw. But subsequent reflection, or the judgment of others, frequently pronounces the reasons to be insufficient. There are, therefore, valid and invalid grounds of an inference. The ground alleged may not be sufficient to support it; or, looking at it from the other side, the inference may be drawn by the mind when there is no reason sufficient to make it legitimate. Thus, although this Law expresses a most important caution against hasty and baseless inferences, it must be further defined and explained before it can be practically useful in enabling us to determine what inferences are legitimate.

Intuitive basis of inference.

§ 196. As Intuition is the original source of our knowledge, we naturally look to it for the first grounds upon which inferences may be built. Knowledge which is given to us in intuition must lie at the foundation of all knowledge and belief; and if in the superstructure errors are found, their source is probably to be found in some of the false inferences which have been drawn. Now we have seen that in intuition there are made known to us either individual objects or the relations between them. And we have seen that these relations may be of sequence in its various forms, of co-existence, and of likeness and unlikeness in their various forms and degrees. But all inferences are expressed in predications; and all predications are the assertion that two objects of thought exist in some relation to one another. Hence it is primarily to the relations given to us in intuition that we are to look as the ground of our assertion of those other relations which are predicated in our inferences.

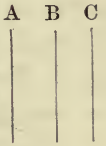
Chiefly intuited relations.

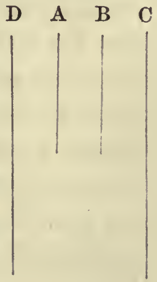
From certain relations which we know, we infer the existence of certain relations not directly intuited. Thus, having known that a certain relation exists between the objects of thought, A and B, and between B and C, we infer that a certain relation exists between A and C. In this case the objects A and C

Two forms of inference.

are directly known, but the relation is not. Again, having known that a certain relation exists between A and B, there comes within our knowledge an object like B: we infer that there exists in relation to this second B an object *like* A. Thus we have apparently two forms of inference: we infer the existence of a relation between two objects both of which are known; and we infer the existence of the unknown term of a relation, together with its relation, to some object which we know.

Illustrations of inference of first form.





§ 197. A few particular illustrations will make more clear the abstract statements of the last paragraph. We have before us three straight lines, A, B, C. We are able to compare A with B, and B with C, and find that A is equal to B, and B to C. We infer, without directly perceiving, that A is equal to C. The relations compared are in this case so simple, and the inference presents itself to the mind with such force, that it is usually expressed in mathematical works in the form of an axiom, or self-evident proposition. "Things which are equal to the same thing are equal to one another." But it is none the less truly an inference, although one regarding which there cannot be in the mind the slightest doubt. If, again, we take four lines, A, B, C, D, of which A is equal to B, D is double of A, and C is double of B, we infer without hesitation that C is equal to D. Here the relations between A and D, B and C are known, a certain ratio of length, A being one-half of E, and B of C. Thus A and B being equal, and the relation between A and D being equal to the relation between B and C, we infer a relation of equality between D and C. This inference is expressed in the mathematical axiom, "Doubles of equals are equal." Similar remarks might be made with reference to the majority of the mathematical axioms. They are inferences immediately based upon intuitions; their objects are simple and perfectly free from variable conditions, and there consequently is not the slightest room for doubt as to the legitimacy of the inferences. Inferences of this simple kind have all the certainty of intuitions; but yet they are not intuitions, unless we assume some other distinction between inferences and intuitions than that which we have given. They have been called axioms, or principles of mathematical thought, but this is perfectly incorrect; they are particular examples of inferences, so simple and unavoidable that the mind can never fail to draw them when occasion requires. The mind universally recognises the respective equality of two lines or figures to a third as a sufficient reason for the inference that the two are equal to one another.

Illustration of inference of second form.

§ 198. We now study an example of an inference in which the existence of an unknown term of a relation is inferred. By a long course of investigation scientific men had come to the conclusion that all material bodies in the universe exert upon one another an influence resulting in motion, and called the Force of Attraction. Illustrations of this force are seen in the falling of bodies to the earth, the motions of the moon and planets, and many other phenomena. By means of many accurate observations, the laws of force, and of the consequent motion of bodies, had been calculated; and so precisely had this been done that astronomers could predict exactly the position of any of the planetary bodies amongst the stars at any given moment. Now it had been observed that the positions of Jupiter and Saturn at certain times were not exactly what they ought to be; there was a certain *variation* in their motions which could not be accounted for by the attraction of any of the *known* heavenly bodies. This variation, therefore, was a phenomenon to be accounted for; it might be the result of a mistake in the statement of the laws of motion; it might be the result of inaccurate observations; or it might be the result of the attraction of some unknown body beyond the orbits of Jupiter and Saturn. The first of these possibilities could not be admitted, because the laws of motion had been tested in innumerable instances and had never before failed. The second was rejected, because the observations had been taken with the utmost precision by skilled observers and accurate instruments. The only inference, therefore, which appeared to have a sufficient reason was the third, that there was some hitherto unknown body beyond Saturn which caused the variation. And the success of astronomers in discovering this body proved the accuracy of the inference. Now here the process of reasoning appears capable of analysis into the following elements: A great body, the sun, exerts a powerful influence over a number of smaller bodies, the planets; these also exert a similar, but, in degree, a less influence over one another; the result of this is that certain complicated relations in space exist between the sun and surrounding planets. Here we have—(1) a number of bodies; and (2) a certain regularity of their motion in space. But a new phenomenon appears; this regularity is in a particular case interrupted: a cause of this interruption there must be, and, so far, no cause is known; the only inference which can be drawn is, that there is some hitherto unknown cause, and that the unknown cause is similar to the causes of motion already known—the forces of the sun and planetary bodies. Thus we have here—(1) a known relation between certain known bodies and their motions; (2) a motion, or variation of motion, not related to, that is, not caused by, these known bodies; and (3) the inference of the other term of relation, the unknown planet, to account for the variation.

Another illustration.

§ 199. Again, in our consciousness, we are aware of two great classes of phenomena, described as voluntary activities and passive states. The former we are conscious of producing by our own effort; the latter we are powerless to produce or to annihilate. As an example of the former we may instance muscular sensations and the sounds of our own voice; as an example of the latter, sounds heard, but not produced, by ourselves, and colours which we see. Now, with reference to our voluntary activities, we are conscious of a certain forth-putting of energy in their production; it makes no difference whether we are aware of the different links which connect the conscious effort with the result or not; we perceive an invariable relation of sequence between—(1) the conscious effort; and (2) the complex of sensations which we regard as its result. But, in the case of passive states, as, say colours, we are conscious of sensations, but the other term of the relation is wanting; these sensations we know that we have not produced; we therefore *infer* the other term of the relation, a cause not ourselves the productive efficiency of which accounts for the sensations. Analysing this process we have—(1) a perceived relation between A (*conscious effort*), and B (*sensations*); (2) a knowledge of B, (*similar sensations*); (3) the inference of A, (*an objective cause more or less similar to* A). And, be it remembered, the objective A, is not an aggregate of other sensations collected somehow together in a group, because every one of these sensations requires to be accounted for in the way that we have now indicated. The objective inferred term of the relation is therefore unknown; we think of it as a cause adequate to the production of the perceived effect, and its nature can be learned, and only learned imperfectly by the aid of hypothesis.

Inferred relation between unknown powers.

§ 200. We take still another illustration of inference, in which there is inferred to exist a certain relation between unknown hypothetical powers. Many years ago Count Rumford made experiments regarding the connection between motion and heat.* He found that the friction of two bodies always produced a certain amount of heat; and that the motion of any body, whenever it was arrested or hindered, resulted in heat. Hence he concluded that heat, as it exists in bodies, is a form of motion. Since his time many experiments and observations have been made regarding the relations of motion, heat, light, electricity, and other natural forces, and it has been clearly established that they are all convertible into one another. But by inference like that which we have examined in the last paragraph, there is some objective Force or cause which has a relation to each one of these phenomena, and the discovery of the correlation of motion, heat, light, &c., does not result in the inference that the one *phenomenon* is the cause of the other. Intimate relations are *perceived* to exist between motion, heat and light; the *inference* is that the unknown causes of these *phenomena*, hitherto supposed different, are in reality identical.

The accompanying diagram illustrates the difference of views produced by the experiments referred to. Originally a different cause, F Cal L, is inferred to account for each of the phenomena m, h, c;

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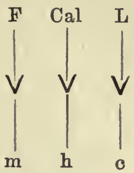
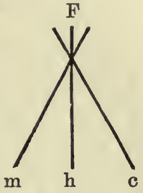
* This discovery is described in a paper published in the "Transactions of the Royal Society for 1798."

but observation shows certain numerous and intimate relations between m, h, c; it is consequently inferred that F Cal L, are really one, as represented in the united lines of the second diagram. And thus also the *relations* between m, h, c are *inferred* to depend upon the community of the Force F with reference to them all.*





§ 201. There are many inferences which have a close relation to classification. We have observed, for example, that all vertebrated animals which fly through the air by means of true wings are oviparous as far as we have been able to discover. These observations collected together in a proposition, are thus expressed, "Birds are oviparous." Having formulated our observations in this proposition, and having come across a class of animals agreeing in essential particulars with the known class *birds,* we *infer* regarding the newly-discovered class that they are oviparous. We do this, although we have not seen the eggs or the nest; and a naturalist would not be satisfied with his observations of a new species of bird until he was able to verify his inference by the examination of the nest and the habits of the bird in the rearing of its young. Now an analysis of this process gives us the following elements: (1) A class of animals grouped together by the possession of certain characteristics, this class, as far as we have observed, having in particular a certain predicable attribute, oviparous; (2) a certain number of animals observed to possess some of the essential qualities of the preceding class; and (3) the inference that the attribute, oviparous, may be predicated of them.

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* F, force; cal, caloric; L, light; m, motion; h, heat; c, colour.

Classification of objects of inference.

§ 202. The preceding illustrations of inference will enable us to advance to the discussion of some important questions regarding it. But, before doing so, we shall offer and explain a classification of the spheres of thought in respect to which inferences are drawn.

(I.) We have, in the first place, inferences regarding the relations of particular parts of Space and Time, and also regarding that which is a result of a combination of Space and Time, Motion. Space and time, we have seen, are the forms of external intuition, and motion is known to us as in terms of space and time. And when the lines, figures, and other dimensions of space, time, and motion are made the subjects of inference, abstraction is made from all particular content of intuition; the inference has reference only to the elements of the forms.

(II.) Inferences are drawn, in the second place, regarding certain Forces or powers which are not known to us directly as phenomena, and which, indeed, cannot be so known. The inferences have reference to the nature, relations, and laws of these powers, as well as to their connection with the phenomena through which they manifest themselves.

(III.) There is a third class of inferences, having reference to the existence and relations of Phenomena. These inferences determine our belief of the existence of phenomena not directly known in relation to certain other phenomena which we do know. But they have not reference merely to the present time; they extend to the occurrence of past events, in which case they depend upon historical evidence; they reach forward also to the future, constituting prevision, expectation, or probability, according to their degree of certainty.

Before, however, we consider these classes of inferences, we must give more minute attention to the determining reasons upon which inference rests.

Section IX.

DETERMINING GROUND OF INFERENCE.

Question proposed.

§ 202. In the preceding section we analysed certain particular examples of inference for the purpose of gaining a general knowledge of the process. We saw that inference is a mental assertion made, without immediate knowledge, regarding some relation between known objects; or, regarding the existence and relation to known objects, of some object or power not directly known. We have seen that in certain cases the same inferences are uniformly drawn by all men, whereas, in other cases there is room for doubt and difference; and that in all cases there is some ground upon which the inference is based. Our task, now, is to examine into the nature of this ground. It is admitted that all inferences form a part of our conscious experience; and the question is, What is it that determines this experience? In any given case of inference, why is it that we infer so-and-so, and not otherwise? When, for example, we see two lines each equal to a third line, why do we infer that they are equal to one another? When we see the motion of any body without us taking place, why do we infer that there is some force impelling it? When we see any seed, in germinating, putting forth a pair of leaves instead of a single one, why do we infer that the future plant or tree will grow by the addition of annual layers of woody tissue upon the outside surface? In other words, what is the *sufficient* reason of any inference which makes that inference necessary or legitimate?

Axioms; their nature.

§ 203. The question of the preceding paragraph may be discussed with reference to the three classes of inferences described in the last section. We make inferences regarding the *forms* of the objects of knowledge, space, time and motion; the *forces* which operate in nature around us; and the *phenomena* which present themselves, or are capable of doing so, to our senses or consciousness. In connection with the first of these classes of inference, a great deal of discussion has arisen regarding the nature of the basis upon which demonstration rests. Certain axioms, such as, "Things which are equal to the same thing are equal to one another," are generally placed at the beginning of mathematical works, and assumed to be self-evident. And we have now to consider the nature of those axioms. One class of thinkers tells us that they are *à priori* judgments, not founded upon anything more simple and original than themselves. Being self-evident, and necessary, and universal they must be original intuitions of the mind. But to this opinion, as it is generally expressed, there is a *prima facie* objection. The axiom quoted above is *general* in its application; it applies to all things, of whatever nature they may be, which are equal to one another. And we may assume it for certain, that a proposition of this kind is not formed until after one or more particular examples of it have been known. This axiom as well as all the others, has been generalised, and the question is, What is the nature of the particular mental acts from which it has been drawn? Now, taking the particular axiom referred to, it is manifest that the single mental act from which it is generalised must be either an intuition or an inference. A is equal to B; C is equal to B; therefore A is equal to C. This is the particular form of the general axiom, and must have *preceded* the general axiom in historical order. In this form the mental act appears to be an inference. A is not *directly seen* to be equal to C, but both A and C are seen to be equal to B; and the inference is drawn. But it has been held that this apparent inference is originally an intuition; that we are not able to predicate that A is equal to C until after we have compared

A priori theory.

Empirical theory.

them directly together; and that having seen several instances in which A and C, being each equal to a third thing, B, they are found to be equal to one another, we generalise the axiom as above. According to this view, the axiom is generalised from experience, and the particular experiences from which it is generalised are experiences, not of inference, but of intuitions brought about by voluntary and artificial means. This explanation is not satisfactory. It has the appearance of being simply invented without any other reason than that it is capable of partially explaining the axiom. There is no evidence whatever that such artificial trials of equality as those postulated are ever made for the purpose indicated. And if they were actually made, the generalised axiom resulting could not have that degree of certainty which it has, unless this certainty had some other ground than the alleged experience.

Axiom generalised from a particular necessary inference.

§ 204. We must therefore examine the view which considers the particular act from which the general axiom is generalised as an act of inference. There is a comparison of two things with a third thing, and the inference that the two things, being equal to the third, are equal to one another. But we must remember that the third thing, which is the medium of comparison between the two others, may not be an external object, but may be a part of our own organism. And we know, from the evidence of language, that the original medium of comparison between the lengths or other spatial relations of external objects is some part of our organism. In many languages, and perhaps in every language, the original standards of measure are particular parts of the body. A foot, a hand's breadth, a span, a cubit, a fathom, are terms of measurement which, from being so universally used in English, and having so many analogues amongst other nations, lead to the conclusion that the parts of the body implied in them afford to men the primary standards of comparison with respect to the relative extension of objects. Now, if we analyze this primary mode of comparison into its psychological elements, we appear to get the following: The eye and the hand of a primitive man having been trained to work together, he applies the hand, outstretched to its farthest limits, to a short object; he sees that the tip of the finger and the point of the thumb coincide with the ends of the thing to be measured; he has, in other words, a certain complex act of perception, the result of which is that he pronounces the object examined a span in length. At another place and time, he applies the same test to another object, with the same result; he remembers that the preceding complex act of perception was essentially similar to this one; and he infers that the length of the two objects is the same. Now, be it observed, this inference is not one which he might make or not, as he pleased. He is compelled to make it; he cannot draw any different inference; and it is this necessity of the particular inference in hand which gives the manifest universality to the axiom generalised from it. And as we see what is the nature of the mental act which precedes the inference, we can see also how the inference is necessary. A complex act of perception is compared with a remembered act, and seen to be similar; the fidelity of each act of perception to the reality of nature being assumed, it follows at once that the objects are equal. Thus, a perception of similarity in the mental acts by which two objects are known to us is the ground of our inferring their equality. But in making this inference it is assumed (1) that each of the acts gives us a true knowledge of the spatial relations of each object, and (2) that these spatial relations have a true, and to our minds, independent existence.

Artificial standard of comparison.

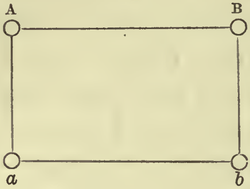
§ 205. If we were to examine the other axioms which deal with the relations of equality, inequality or proportion of extended bodies, we should find that the psychological basis of them all is a perception of likeness or unlikeness between the sensations of eye and muscle, by the combination of which the relative dimensions of the bodies become known to us. But it is soon found that by a comparison of these sensations without any artificial assistance correct results are not obtained; and moreover, the natural measures of length, the hand or the foot, are not exactly the same in different individuals. Hence, for the sake of greater accuracy, and of having a common standard, artificial measures made of wood or metal are invented. But even after this has been done, the psychological basis of inference is not changed. We apply a foot-rule to a body to discover its dimensions; but this is only an artificial contrivance to enable us more accurately to compare our perception of its spatial relations with that of another body, or to compare our measurement with that of other individuals. There is thus recognised the fact that objective standards of spatial dimensions are more reliable than subjective or organic ones.

Axioms applied to time and motion.

§ 206. The axioms of equality and inequality which are usually applied to space may be applied to time also. The natural measures of time are—(1) our sensations considered as succeeding one another; and (2) our perception of certain bodies which are found to recur at regular intervals. Inferences regarding the temporal relations of events must be founded upon comparison of the psychological acts by which these relations are estimated. But, as a rule, inferences regarding time are combined with the relations of space, as when we infer regarding the time which it will take a certain body to pass through a certain space. But before any inference can be drawn it must be shown or assumed that the motion of the body is either uniform or varies according to certain known laws. This being granted, inferences can be drawn with perfect certainty.

Certainty of inference accounted for.

With reference to all reasonings regarding relations of space and time, either separately or combined, it has been noticed that there is a remarkable degree of certainty and precision connected with them. It is also found that in simple cases no other inference is possible than that which is drawn. This precision and necessity of inference are to be accounted for by the nature of the circumstances in which the inference is made; A and B are two dimensions of space or time, each made known to us in the acts of perception *a* and *b*. In consciousness we compare *a* and *b* together, the one being actual, the other remembered; we see their likeness, and we believe that each mental act is a true transcript of the objective quantity. This being so, the inference of the equality of A and B follows of necessity, simply because there is no other inference which has any foundation whatever. And even if, by direct comparison, we found that A and B were not exactly equal; we would not conclude that our *inference* was erroneous, but that some element of error had entered into *a* or *b* or the comparison of them. Thus although it may be quite true that the generalised axioms regarding space, time, and motion are founded upon experience of particular inferences; it is also true that there is something which determines that this experience must be thus and not otherwise. There are certain relations between our conscious intuitions and the quantities of space and time given in them, which afford a basis for the inferences which we draw, and afford no basis for any other inference. No other inference is possible to us, and hence we call these inferences necessary.



§ 207. We now pass on to consider the ground of

Inferences regarding unknown forces.

inferences regarding forces not directly known. We have already in §§ 198-99 given a description of the kind of inferences to which we refer. There is a certain conscious effort exerted which is followed by a certain result; an event similar to this result occurs, but without any effort on our part; we infer an objective power of which it is the result. And the question is, upon what ground do we make this inference? Before considering this question, we must, in the first place, postulate that there is given to us in consciousness a knowledge of power. Muscular sensations are the subjective side of that of which muscular effort is the objective. And muscular power is not known to us as a *relation* between muscular sensations and some result. Neither is power known to us as a relation between *any* mental events and their consequents. Simple succession can never give us the idea of power. But in the consciousness of muscular sensation, the objective side of which is muscular effort, we have a direct knowledge of power, and when the organism is in a healthy state, we are able, by means of other sensations, to know the results of the forth-putting of this power. Thus our knowledge of causal efficiency is intuitive, although it no doubt takes a little time and experience to connect muscular efforts with their proper results.

Knowledge of power intuitive.

Analysis of inferential process.

§ 208. Having now got the two terms of the first relation, conscious effort and its result, another object, a passive sensation, comes before consciousness. We know that it is not caused by us, because

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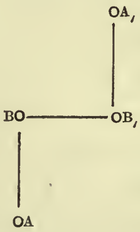
we have been conscious of no forth-putting of effort in its production. But why do we seek for its cause at all? Some people would answer that it is because we know *à priori* that every event must have a cause. Perhaps this statement may be resolved into the simple fact that we are reasoning animals, that by our birth as human beings we inherit a tendency to search after the relations of things, and that by the same birth-right we are never satisfied until we have discovered the relations and the causes of the things we know. If this is a correct interpretation of the law we admit its truth. Now comes the final question—what is the ground of our inference that the known passive sensation is caused by an unknown objective power? The relation between A and B is known; B, is similar to B, in as far as it is an object of consciousness; the inference of a subjective cause is excluded by the conditions of the case; the only possible inference, therefore, is that of an objective cause, A, holding the same relation to B, which A holds to B. It must be admitted, however, that this inference is usually accompanied by other circumstances which give it form. A, is usually connected with a group of qualities constituting an external object. But into this group of qualities the subjective idea of power is invariably projected from which it can never be eliminated except by the unnatural attempts of a phenomenal psychology. The child attributes personality and



power to the stick which has given it pain, and begins to beat it. The untutored savage thinks a spiritual power into every object of Nature.

Hypothetical nature of inferred causes.

§ 209. The inference of some objective power for the events which we ourselves do not produce is *compulsory;* but there is a great room for doubt and difference as to the nature of that power. Men primarily inferred the existence of innumerable spirits; others have postulated a common substratum, matter; others infer a universal mind; others again conclude that there are various powers mutually correlated, which are but forms of a universal Force. As this is not a work upon metaphysics, we do not feel called upon to discuss these conflicting theories. But we may point out that inferences regarding the nature and laws of the unknown cause or causes of phenomena must, from the nature of the case, be hypothetical. And the best that we can do is to adopt that hypothesis which, to our minds, most fully explains the phenomena. It is therefore upon a careful study of phenomena and their mutual relations that we should build our hypothetical inferences, taking care that no phenomena be overlooked or placed out of their proper relations. It would take us far beyond our limits to discuss this subject as it should be discussed. Some have held that because in these matters the absolute certainty of mathematical demonstration or of intuition is unattainable, they ought to be excluded from the sphere of science altogether. This, however, would be an arbitrary limitation of the sphere of science against which the actual practice of scientific men is a standing protest. *Hypothesis fingo,* Newton to the contrary notwithstanding, is the practical language of the man of science, even in cases when there appears to be no hope of his hypothesis ever being directly verified.*

Inferences as to existence and relations of phenomena.

§ 210. We now come to the consideration of inferences regarding the existence and relations of phenomenal objects. Illustrations of these inferences have already been given in § 200. . . . We have seen also that they may be generally divided into two classes, in the first of which we infer some relation to exist between phenomena which we know; and in the second we infer the existence of a phenomenon not directly known, and holding a certain relation to another phenomenon, or set of phenomena, known to exist. And the question to be decided is, what is the ground of the inferences we draw in each of these cases? Now it must be observed that in drawing these inferences there is a great room for error. Thousands of instances might be pointed out in which false relations have been supposed to exist between phenomena. It must be admitted, then, that inferences may be drawn which are not in conformity with the truth of nature. And therefore we must consider, not the ground of inference in general, but the ground of correct inference. But in this it is implied that amongst phenomena there exist certain objective relations which may be known by us or not, and if our inferences are not the true expression of these objective relations they are not correct. We observe, for example, that night always precedes day, but if we were to infer from this uniformity of sequence that a causal relation exists between them, our inference would be erroneous, as there are various reasons for our concluding that this is not the true relation. In drawing inferences, therefore, it is necessary to distinguish between those relations of things which are accidental and those which are essential. In order to do this properly, we must have recourse to those laws of induction which Bacon and his followers have formulated. The object of these laws is to enable us to distinguish between *accidental* and *essential* co-existences and sequences. Those relations which are of the latter class are thought to have some connection with the cause of the phenomena. And those inferences are thought to be correct which connect together phenomena between which there is objectively a causal relation, or a relation depending upon identity of causation. The relation, for example, between the lowering of the temperature of the atmosphere and the deposition of dew is an essential one, and the inference which connected the one with the other was correct, although, perhaps, it is not proper to call this the causal relation. It is correct also to infer that animals which we have discovered to have some of the essential characteristics of birds are oviparous, because we have learned that there is an essential objective connection between these characteristics

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* It may be fairly maintained, however, that the sphere indicated above belongs rather to metaphysical than to physical science.

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and that quality which we infer. Thus it appears that before we can be satisfied with inferences regarding phenomena, the subjective connection which we form must be recognised as being the counterpart of essential objective relations between things. Inferences are not concerned merely with the relations of ideas, but also, and principally, with the objective connections of real things.

Section X.

THE FORM OF INFERENCE.

Controversy regarding the syllogism.

§ 211. Is there any general form according to which the mind acts in the drawing of inferences, and, if so, what is that form? This question has given rise to a good deal of controversy, especially with reference to the claims of the syllogism to be considered the universal type of reasoning. It has been asserted, on the one hand, that, if all the mental acts and principles which are involved in the drawing of inferences be explicitly stated in language, the statement will assume the form of a syllogism. It has been held, on the other, that there are many instances of reasoning in which the mental process cannot, without the greatest violence, be put into the form of a syllogism, although it is admitted that many kinds of reasoning do naturally assume that form. Before discussing this question we must examine the nature of the syllogism. According to the accounts of the syllogism, which we find in logical treatises, syllogism is inference which is drawn from the general, from some proposition or judgment which is generally true. There are three terms in every syllogism, two of which, the minor and major terms, are the subject and predicate of the conclusion; while the third, the middle term, is found in each of the premises, and is the medium by which the terms of the conclusion are compared together. All these terms are held to be the names of concepts having a greater or less denotation and connotation. And in the syllogism there is a comparison of the denotation or the connotation of the minor or major terms, with the denotation or connotation of the middle term. This comparison has for its object to determine whether the one term contains the other, either wholly or partially, that is whether the denotation or the connotation of the one term includes, wholly or partially, that of the other. Now, in order to determine the character of the claims of the syllogism to be considered the only type of reasoning, we shall have to consider—(1) whether inference proceeds only from the general; (2) whether nothing but concepts are the elements of inference; and (3) whether the relation of containing and contained is the only relation regarding which we infer.

Inferences may be drawn from particulars.

§ 212. The first of these points has been practically decided by us already. We have seen that some of the so-called mathematical axioms are generalised from particulars, and consequently that particular inferences are drawn before the generalised axioms are formed. We have seen, also, that in perception an objective cause of our passive states is inferred to exist from the consciousness of some particular sensation uncaused by our conscious effort. Now, the only ground upon which inferences of this kind can be expressed in the form of a syllogism is, that there is an *à priori* principle latent in the mind which serves for the major premiss of the syllogism. Against this theory we have already adduced objections.* And the overthrow of this theory renders it impossible to put into syllogistic form the inferences referred to. There are, then, particular kinds of inference which do not proceed from general judgments, but from particular objects of knowledge.

Inference does not regard concepts but objects.

§ 213. With reference to the second point, it is maintained by some that inference has to do primarily with concepts and the relations of concepts. But, as individual objects undoubtedly form subjects of reasoning, concepts are taken to be not merely the representations of the qualities of a class, but also of an individual. To this doctrine, that reasoning refers exclusively, or even principally, to mental representations, we must take exception. Every mental representation which we make, either of an individual object or of a class, has significance to us only as related to the real objects of which it is a concept. When we make use of the term *man*, we mean not our mental representation of human attributes, but the real external objects possessing human qualities which we denote by that name.

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* § 203.

And when we say "man is mortal," we mean that the real beings whom we call men will all die. Thus, if we are to depend upon what consciousness reveals to us, inference has reference primarily not to concepts, but to the real objects or classes of which the concepts are more or less complete representations. And the predication of the inference asserts or denies a certain relation to exist between these objects.

Relations predicated in inference.

§ 214. What is this relation? Is it only that of the container and the contained, the mutual inclusion or exclusion, in whole or in part, of two objects of thought? A reference to particular cases of inference will soon decide the question. From a comparison of certain angles and triangles we infer —"The angles at the base of an isosceles triangle are equal to one another." This is certainly not a relation of inclusion, either total or partial. From a variety of considerations we infer that the rapid cooling of the atmosphere is the cause of the deposition of dew. It would be difficult to put this inference into the stereotyped form. From many experiences we infer, when we see smoke, that combustion is going on somewhere near at hand. The relation expressed in this inference is certainly not one of inclusion. In short, since inferences consist of predications, and since predications assert *any* of the relations which may be perceived in intuition as existing between two objects of thought, it is manifest that reasoning must occupy itself with *all* these relations. This the syllogism, in its present form, does not do; and hence, in its present form, we maintain that it is the type of only a particular, although important, variety of the reasoning process.

Question as to form of reasoning postponed.

§ 215. Having decided against the claims of the syllogism to be the universal form of reasoning, we might inquire if there is any other form which can legitimately make similar claims. But we shall be better able to consider this question after we have studied more fully different reasoning processes with which we are familiar. We have already divided the sphere of inference into the subordinate sphere concerned about (1) space and time, with their various divisions and combinations, (2) the non-phenomenal causes of things sensible, and (3) the existence and relations of phenomena. But in these different spheres the grounds upon which the inferences rest may vary greatly in their nature and extent, and the inferences themselves may have every variety of probability attached to them. Upon the principle of advancing from the more concrete and particular to the more abstract and general varieties of inference, the following appears to be a suitable division: (1) Inferences regarding the occurrence of particular events, depending upon evidence or testimony; (2) Inference founded upon analogy and induction, either particular or expressed in a less or more certain general law; (3) Deductive inferences from general principles.

SECTION XI.

EVIDENCE; INDUCTION; DEDUCTION.

Inference depending upon evidence.

§ 216. It is frequently necessary, in the common affairs of life, to form opinions regarding the occurrence or non-occurrence of events, or the nature of alleged facts which have not come under our own observation. These opinions are of the nature of inference depending upon what is called Evidence. We may divide the facts or events regarding which evidence is taken into two general classes: (1) contemporary facts or events alleged to exist or occur in our own time, within the memory of persons now living; and (2) historical facts or events alleged to exist or occur in some past generation. The evidence on which inferences regarding the first of these classes of facts are based is most frequently human testimony, although, in the absence of that, or when it is not thought completely trustworthy, a great variety of circumstantial evidence may be resorted to. Inferences regarding historical facts or events depend upon tradition, historical records, the existence of commemorative monuments and other things. We shall refer to certain principles by which we are guided in drawing inferences in each of these cases.

Regarding contemporary facts.

§ 217. The most direct evidence of contemporary occurrences which we have not ourselves observed is the testimony of others. But in receiving the testimony of others there are various things which must

Testimony.

be considered before placing implicit reliance upon it. We have found by experience that some persons are not truthful in relating what they have seen or heard ; that some persons are incapable of accurate observation, mixing up their own fancies or prejudices with the facts which they are observing ; that some persons are very liable to be governed by interested motives so as deliberately to misrepresent in their own favour the facts which they relate. These and other considerations have led to the establishment of various legal customs connected with the taking of evidence, such as the imposition of an oath, cross-questioning, and others. For the purpose of correcting human testimony it is found also that a variety of circumstantial evidence is of very great importance. The majority of the alleged occurrences regarding which inferences are to be drawn leave some permanent marks or traces behind them which may be afterwards observed, and these, in the hands of a skilful interpreter, frequently form the basis of important and true conclusions. There is, however, great difference in the skill of different persons in discovering the significance of permanent marks or signs. The barbarous tribes of an uncultivated country usually show remarkable acuteness in reading the meaning of the traces of past events ; while the natural or acquired skill of the professional detective is often equally wonderful.*

Circumstantial evidence.

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* For a specimen of this acuteness and skill the reader is referred to Edgar A. Poe's remarkable description, "The Murders in the Rue Morgue."

Value of evidence.

§ 218. In determining the value of evidence, there are, generally speaking, two things to be considered; the nature of the evidence itself, and especially the character of the persons by whom it is given, and the nature of the fact testified to. The mind frequently refuses assent to alleged facts in consequence of the improbability of these facts occurring. When a person is well acquainted with a particular class of facts, he knows pretty accurately what phenomena of that kind are likely in given circumstances to occur, and he refuses to accept the testimony of ignorant observers if their testimony contradicts his expectations. The antecedent probability or improbability of particular occurrences taking place exerts a great influence upon our estimate of the value of the evidence adduced in their favour. This predisposition to believe or to disbelieve alleged occurrences varies greatly in different minds, and depends greatly upon the kinds of experience with which the mind has been familiar. If, for example, an expert in physical science is informed of the occurrence of certain phenomena, such as table-rapping and other things said to be performed by spiritual agents, he feels a strong predisposition to attribute the phenomena either to deliberate deception on the part of some one concerned, or to the operation of some of the natural forces with which he has already become acquainted. This predisposition, although a valuable safeguard against indiscriminate credulity, often proves a hindrance to the discovery of truth by preventing competent men from undertaking a careful

Predisposition to receive or reject evidence.

examination of the evidence upon which alleged occurrences rest. With reference to every human being it may be said, "There are more things in heaven and earth than are dreamt of in your philosophy," and consequently in the mind of every human being there is likely to be a predisposition to reject the evidence of some things which are actually true.

Regarding historical events.

§ 219. We now proceed to the consideration of the nature of the evidence upon which inferences regarding the occurrence of historical events are based. And it is manifest that, as a rule, this evidence cannot be so satisfactory as that of contemporary occurrences. The witnesses of historical events are dead; they cannot be put upon their oath; they cannot be cross-questioned; the whole of that searching process of eliciting from unwilling, or stupid, or inconsistent witnesses the true state of the case, with which we are familiar in modern courts of law, must be foregone or, at best, very imperfectly performed. The evidence upon which our inferences are built consists chiefly of written documents containing either descriptions of or allusions to the events concerning which we are inquiring. The accounts of these written documents may be confirmed or modified by the discovery of monumental figures or inscriptions, or other remains, and by the perpetuation amongst the people of traditions or customs apparently depending upon the alleged events. In examining the written documents, the most important points which should be ascertained are: the persons by whom these documents were first written; the time when they wrote and the opportunities which they enjoyed of becoming accurately acquainted with the events which they describe; the character of the writers for intelligence and truthfulness, and especially the feelings by which they might be influenced in writing their accounts. These points having been determined, either with certainty or with a greater or less degree of probability, there will remain to subject the documents themselves to a criticism something analogous to the cross-questioning of legal courts. This criticism will have for its object the obtaining of a true and complete view of the occurrences described, by bringing together disjointed accounts, harmonising, where possible, apparent inconsistencies or incongruities, and, in short, bringing into a consistent unity the great variety of unsystematically-arranged details of events, and character, and life which the documents present; but it may possibly result in the conclusion that such a unity is unattainable. Examples of this historical criticism are to be found in modern inquiries regarding the lives and labours of Homer, and Plato, and other ancient worthies, and especially in the modern criticism of the Christian Scriptures.

Prejudices how to be treated.

§ 220. As in the treatment of the evidence adduced in favour of the occurrence of contemporary alleged events people are under the influence of a predisposition to believe or disbelieve, according to the view which they are likely to take of the probability of the events occurring, so there is a similar predisposition with reference to historical events. From our own experience and from the recorded experience of others, we form opinions as to what may reasonably be expected to take place in particular circumstances, and these opinions influence our minds very strongly in our treatment of historical evidence. These preformed opinions, or prejudices, as they are called, it is impossible to get rid of, simply because it is impossible to annihilate our own past mental history and the influence which it has had in forming our present character. But it is possible for us to understand that our prejudices may prevent us from attaining to a knowledge of the truth concerning which we inquire, and it is possible for us so far to overcome our prejudices as to admit in particular cases that what appears antecedently improbable to us may nevertheless be true. The antecedent improbability, therefore, of any event which is not merely ridiculous and absurd, should not prevent any one from carefully examining the evidence upon which it rests.

Analogy.

§ 221. We now proceed to the consideration of those inferences which are drawn from particular facts or relations, and which are usually called inductive. One of the commonest forms of this is analogy. Two objects agree in certain particulars, and it is inferred or expected that they will agree in others. A child sees a tin rattle and hears the rattling noise which it makes when shaken; when he sees something afterwards at all resembling the rattle he expects from analogy that it will rattle when shaken. In this case the expectation or inference appears to be founded upon the principle of association; when two or more qualities have appeared once or repeatedly in connection with one another, the subsequent appearance of one of them or of a similar one, leads to the expectation that the others are capable of realisation. This rudimentary example of analogy assumes a higher type as knowledge increases and we begin to learn essential resemblances and differences of things. In physical science inferences founded upon analogy have led to most important conclusions or discoveries. It was by analogy that Newton drew his inference regarding the cause of the motions of the heavenly bodies. It was an apparent analogy which led Franklin first to infer, and afterwards directly to ascertain the identity of lightning and electricity. Innumerable examples of inference founded upon analogy are presented in the science of language. The philologist finds in Latin or Greek a word the original root of which he cannot discover in these languages; a word analogous in form and meaning is found in some other Arian language, as the Gothic or Sanskrit; and in these latter languages the root, perhaps, is found, and thence inferred to be the original form of the Latin or Greek word in question.

Analogy of accidental qualities not the ground of inference.

§ 222. It is manifest that the analogy between two objects which may form the basis of a reliable inference cannot be a simple resemblance of some *accidental* qualities. There must be a resemblance between qualities which are found to be *essential* before the inference from analogy can be drawn. A shark swims in the sea, and so does a whale; but this accidental resemblance would never form the basis of analogical inference to any reasonable mind. The qualities of two bodies which are to form the ground-work of analogical inference must be essential, or be connected with essential qualities of the bodies in question; and also the quality which is inferred must have some essential connection with the other qualities from whose resemblance the inference is drawn. Unless there is a recognised objective connection the inference is baseless.

Induction.

§ 223. Induction proper has for its basis an observed relation of phenomena, or the elements of phenomena, in a greater or less number of cases; and the inference asserts what will take place in all similar cases. Inductive inference affirms regarding all instances of a particular kind what is observed to be true of a certain number of instances of that kind. As far as has been observed, all animals of the bovine kind chew their cud; but naturalists assert that this is true universally. As far as has been observed, all material bodies have weight; but physicists admit no exception to the universality of the quality. Thus in Induction the inference goes beyond the observed facts, and in order that this extension of the inference may be valid, there must be some foundation for it. Let us see what this foundation is.

Syllogistic theory.

Those who are not satisfied until they have put every kind of reasoning into the form of a syllogism tell us that inductive inference is a syllogism with the major premises suppressed; and further, that the suppressed major is the principle that "Nature is uniform in her operations." Newton's induction then would appear as follows:—

> "What nature does sometimes she does always;
> Nature makes this, that, and the other body to gravitate.
> ∴ Nature makes all bodies to gravitate."

Even although we allowed that all inductive inferences are naturally expressed in the form of a syllogism, it seems inconceivable that such a crude, indefinite, and practically worthless major premiss as the one cited should have retained its position so long. As an example of its uselessness we give the following:—

> "Nature is uniform in her operations;
> This, that, and the other animal of the class mammalia live on dry land.
> ∴ All mammalia live on dry land."

Of course it will be at once answered that this is an accidental quality. Very good; then let a principle be adopted which will recognise the distinction between essential and accidental qualities, which the principle above named does not pretend to do.

Foundation of induction.

§ 224. What, then, is the foundation upon which inductive inference rests? It is certainly not a mere subjective association, because that is quite as incapable of distinguishing between the essential and the accidental as the principle above referred to. There must, therefore, be some recognised objective connection in things which forms the basis of induction regarding them. We have already seen* that in the formation of a class or species to which we apply a common name, we separate by abstraction some of the qualities from the others, according as we think them essential or not to the constitution of the species. The Essentia of the species comprises all these qualities without which the species would not be what it is; this essentia, although formed by abstraction, and therefore determined by us, has a permanent objective existence in the various individuals from which abstraction has been made. Now, as we have determined such and such qualities to constitute the species, it is manifest that wherever any individuals of the species exist, these qualities must be found; if any other individuals are found destitute of one or more of these qualities, we simply say that they do not belong to that species, or we constitute them into a subordinate variety of the species, or we enlarge the definition of the species so as to include them, as the case may be. Thus, in drawing the inferences which result in classification, we assume the permanence and immutability of natural species, and having determined by careful examination and comparison what are the essential qualities which constitute the species, we infer with confidence that all individuals belonging to the species possess these qualities. And if any individuals, apparently members of the species, are found destitute of its

The permanence of species.

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* §§ 157–163.

essential qualities, we either relax the terms of admission into the species, or treat the refractory individuals to scientific excommunication.

Axioms generalised from a single inference.

§ 225. There are some cases in which a single instance may lead to a universal induction. For example, when, having applied a common measure to two lines, we infer their equality, the mind advances at once to the general maxim,—things which are equal to the same thing are equal to one another.

The nature of the original inference accounts for the immediacy and universality of the induced proposition. The mind cannot help but draw the inference in any particular case, as we have seen;* neither can it conceive any circumstances in which, from the same basis, a different inference could be reached; hence the universal axiom is accepted without hesitation. There are other inferences of induction which appear to be made with equal readiness. Two ivory balls of equal size are suspended by strings of equal length; they are made to fall down equal arcs of a circle at the same time and strike against one another; the force of the one counteracts that of the other. Hence the generalised principle, "Action and re-action are equal and opposite." Now, the particular mental act from which this law is generalised is manifestly an inference. We see two bodies of equal sizes moving through equal spaces in equal times; and we observe that the motion of each is equally arrested by the concussion.

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* § 206.

The inference pronounces that the *force* which each ball exerts is exactly met and counteracted by that of the other ball. As we know nothing about objective force, except as an inference to account for otherwise unaccountable phenomena, so we know nothing about the laws of forces, except as inferred from the relations of observed phenomena. But the inference is one which cannot be avoided, simply because there is no foundation for any other inference. And since the particular inference is an unavoidable one, the induced principle is seen, without doubt, to be of universal application.

Different kinds of induction.

§ 226. Thus we see that all general laws are the result of induction, as well as those general propositions which express the characteristics of classes of objects. But there are inductions and inductions. Some inductions, as those regarding the relations of mathematical magnitudes, and the laws of forces, are founded upon particular inferences, these inferences being unavoidable in the present condition of things. Other inductions are founded upon the perceived relations of certain qualities which we have determined, by observation and comparison, to be essential to the constitution of particular classes. Thus, in all cases of induction there must be recognised the existence of a certain established objective order of things, and our inductions are only an expression in language of what we believe to be essential relations of this objective order. If our inductions accurately correspond to the objective order, we say that they are true; if not, not.

Deduction.

§ 227. We are now brought to the study of the last form of inference, the deductive. Here the mind passes in reasoning from the general or universal to the particular. Having already known something to be true of a whole class of things, we are able to affirm it to be true of every individual of the class. Familiar illustrations of the deductive process are seen in the application of the general laws of natural forces to particular cases, and in inferences regarding the qualities of particular individuals of a class from our knowledge of the essential constituents of the class. The astronomer, having determined the laws of the motion of some particular planet, is able to infer with precision the particular point in the heavens which it will occupy at any particular moment. The chemist, having determined the laws of the combination of particular elements, is able to predict the result in any special case. The naturalist, having discovered the universal characteristics of some species of animals or plants, expects with certainty to find these characteristics in every new specimen. The natural form in which inference of this kind is thrown is, no doubt, the syllogism. And the principal value of the syllogism is to state in an explicit methodical form those deductive inferences at which the mind arrives, frequently without any conscious reference to the major premiss at all.

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Certainty of inference depends upon major premiss.

§ 228. In order that the deductive inference may be thoroughly reliable, the major premiss must be an expression of some essential objective order or law of things. If, for example, the major premiss of a syllogism be "All swans are white," an inference from that, with reference to the colour of any particular swans, hitherto unseen, could not be made with perfect certainty. We could never feel certain but that birds might be found possessing all the essential characteristics of swans, but which were of some other colour. Whereas, if we have for our major premiss, "All cows ruminate," the inference with reference to particular animals of the species is certain, because the predication of the major premiss expresses an essential condition of the class. Deductive inferences which have for their object some accidental quality or state of things can never amount to more than a probability. The probability of the inference is the consequence of the want of certainty which characterises the major premiss. And that want of certainty arises either from the accidental nature of the relation which is predicated in the premiss, or from our partial ignorance regarding it.

Section XII.

CONCLUSION.

Hypothetical Inference.

§ 229. By way of summing up the conclusions at which we have arrived in the preceding sections, we may first point out the different kinds of inferences which we draw. One of the most important of these is the *Hypothetical Inference*,* by the object of which we account for the existence of known phenomena. The existence of any particular sensation is accounted for by inferring some objective hypothetical power. The existence of a foot-print upon the sand is accounted for by the supposition that a man walked along the sand some time previous. The statements of a historical writer are accounted for by the inference that the events which he describes actually occurred. Any particular phenomenon or complex series of phenomena being given, we account for its existence and character by inferring hypothetically some antecedent cause sufficient to account for it. In many cases we may never be able to verify the inference by direct knowledge; but it matters not, the inference must be made, nevertheless, to satisfy that insatiable craving after a knowledge of the causes of things which is our birth-right as rational beings. In many other cases the hypothetical inference may be verified, as in the discovery of the planet Neptune, and in the discovery of certain new metals which had been inferred to account for peculiar phenomena in the spectroscope. In cases where the hypothetical inference cannot be verified by direct observation, various degrees of probability, or even a practical certainty, may be obtained by considering the degree of completeness with which the particular inference accounts for the phenomena, and the absence of a foundation for any other inference.

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* This, of course, is altogether different from the hypothetical form of the syllogism.

Particular Inference.

§ 230. *The Particular Inference founded upon subjective association* is very familiar. Two or more objects of knowledge having occurred together a few or several times, there is formed an expectation that where one of them appears the others may be looked for. The occurrence of these objects together leads the mind to suppose that there is some objective connection between them, and this supposition forms the ground of the inference. When this supposition is converted into actual knowledge, and the connection between the two associated phenomena is ascertained, the inference is no longer problematical but acquires the character of a certainty. *The Particular Inference founded upon a comparison of simple Intuitions* is also characterised by certainty from the very first. When we infer that the lines A and B, being each equal to C, are equal to one another, there is no other inference which we could possibly draw.

Inductive Inference.

§ 231. *The Inductive Inference, founded upon uniformity of experience,* never amounts to more than a high degree of probability. But it is not therefore to be despised, because in many cases nothing but a certain degree of probability is attainable. And in the practical concerns of life probability is our usual guide.

The Inductive Inference, founded upon a knowledge of the essential relations of the things concerned, partakes of the same amount of certainty as the knowledge on which it is founded. Illustrations of this are seen in the axioms of mathematics and of natural forces, and in the inductive generalisations regarding natural orders and species.

Deductive inference.

The Deductive Inference is based upon some general principle, and rests for its conformity to truth upon the assumed truth of the principle from which it starts. The general propositions in which the different species of induction terminate are the starting-point from which deduction proceeds in reverse order.

Conclusion.

§ 232. With reference to the form in which inferences should be expressed, it appears to be a matter of very little consequence. All knowledge may be resolved into the knowledge of objects and their relations, and all inferences are concerned about the existence and relations of objects, or the occurrence of events, not directly known, and about the relations of known objects. Every inference referring to an object or a relation not directly known must be founded upon some relation which is known either by intuition or some preceding inference. And, in the arrangement of the different elements of the reasoning process, the grand requisite is that the mind should be able to pass readily, and without hesitation, from the ground to the inference. To secure this requisite is sometimes very difficult in consequence of the obscurity or complexity of the subject with which we may be dealing. And we need not expect to get much assistance from the formulæ of the logician. Difficulties in thinking are not to be overcome by any formal rules which may be laid down, but by careful and persevering attention to the subject, and sometimes by a natural genius with which some people are peculiarly endowed. Consistency and truth are the two things which we should strive after in our thoughts. The former has reference to the mutual relations of the different elements of our knowledge or belief; the latter to the conformity of our thoughts with the essential order of things. For the satisfaction of that rational nature, the phenomena of which we have been studying, there is demanded not merely an elaborate and consistent system of doctrine which may after all be a mere airy castle, but also and especially a certain confidence that what we think is a counterpart and expression of that which is.

VOCABULARY

OF

PHILOSOPHICAL TERMS.

As this Manual of Psychology may be used by some who are not accustomed to reading philosophical works, the Author has deemed it advisable to append a vocabulary of terms which are not likely to be familiar to such readers, hoping thereby to make the work more useful. The terms explained are mostly found in the present work and widely employed in books upon this and kindred subjects.

Abstract.—To withdraw the attention from certain qualities or elements of any object of knowledge with a view of fastening it upon other elements or qualities. For example, when we attend to the *colour* of an object we abstract the mind from its form and weight.

Abstracted.—The quality or element to which the attention is thus turned is usually said to be *abstracted* from the others, although, properly speaking, it is the mind which is abstracted from them.

Abstraction.—The quality or element of the objects of our knowledge singled out from the others for special attention is often called an abstraction. Various qualities or elements of knowledge may be singled out from a number of objects, and these qualities, which are the same or similar, joined together in a mental image which is called an *abstraction.*

Accident.—In forming classes of objects there are found some qualities which are present in some of the objects but absent in others; these are called *accidents.*

2 A 2

Accidental.—A quality or element of objects or of classes which is thus sometimes present and sometimes absent is said to be *accidental*, to distinguish it from those elements which, being universally present, are called *essential.*

Affinity.—A term expressive of a variety of relations between objects of our knowledge. Objects which are related to one another, as a cause and effect, parts and a whole, sign and thing signified, and so on, have a natural connection with one another, so that when one is thought of the others naturally come before the mind. Such objects are said to have mutual *affinity.*

Analogous.—When two things are similar in some of their qualities or effects, although entirely different in others, they are said to be *analogous.* The fin of a fish, for example, is analogous to the wing of a bird, or the leg of a horse.

Analogy.—A resemblance between two or more objects in some particular qualities or actions is called an *analogy.*

Analyse.—When we separate any object of knowledge into the simple elements of which it is made up we *analyse* it.

Analysis.—The act or process of separating objects of knowledge into their constituent elements. A careful analysis of any complex product is a most important condition of obtaining a thorough understanding of it.

Antecedent.—When one object of knowledge comes into the mind before another it is called the *antecedent.*

Appetite.—The desire which we have to satisfy those wants which originate in some condition of our physical organism, such as hunger or thirst, is called an *appetite.*

A posteriori.—When the progress of knowledge or reasoning is from effects or consequents to causes, or conditions, or antecedents, we are said to proceed *à posteriori.*

A priori.—Knowledge or thought is *à priori* when we proceed from causes or conditions to effects or consequents.

Assertion. — When the mind affirms that any object of knowledge exists, or that any relation, simple or complex, exists between two or more objects, an *assertion* is made. Assertion expressed in words is *predication.*

Association.—The mental union which binds together two or more objects of knowledge, so that when the one appears before the mind the others follow, is called *association.*

Assumption.—At the beginning of any course of thought or discussion certain things must be taken for granted as known; these constitute the basis of argument or *assumption*, and, if put into the form of a syllogism, will be found in the premises.

Audible.—That which is capable of affecting the organ of hearing so as to produce a sound is said to be *audible.*

Being.—The most abstract of all mental products. When the mind withdraws its attention from all the qualities by which objects are known and thinks only of the fact that things *are* or *exist,* it reaches, as nearly as possible, to the conception of a *Being.* To think of Being, but without any particular qualities or things *to be,* is the highest attainment of metaphysical skill.

Belief.—Things which we receive and admit as true although not directly known to us are said to be believed, and the act of the mind in assenting to this truth is *belief.*

Category.—The classes of things to one or other of which all known objects must belong were called, by Aristotle, *categories;* into some one or more of these classes everything knowable could be placed. They were ten in number: substance, quantity, quality, relation, action, passion, time, place, situation, and habit. Hence category comes to be nearly synonymous with class or list. And, as the categories indicate the assertions or predications which may be made regarding any object, a proposition affirming any of these assertions is called *categorical.* Hence, generally, *categorical* means direct or absolute as distinguished from indirect, conditional, or hypothetical.

Causal.—Pertaining to a cause.

Causation.—The act of causing or producing anything which begins to be.

Cause.—The agent or power by the operation of which any change is produced or any action or condition effected. By some writers *cause* is held to mean the *invariable antecedent* of some event without which the event could not be.

Class.—A group of individual objects of knowledge collected together in consequence of their resemblance in certain elements is called a *class.*

Classification.—The act of arranging individuals into classes, or lower into higher classes.

Cognise.—A term frequently used in psychology, meaning to know.

Cognition.—The act of *knowing,* in the proper sense of the term, is called *cognition.* This term is used especially in contradistinction to *feeling* and *volition,* two other and distinct classes of mental phenomena. The powers of the mind engaged in the different processes of cognition are called *cognitive.*

Colour.—The name of that quality which is known through the sense of sight. There is an ambiguity in the application of the term *colour;* sometimes it is applied to the sensation in the mind which results from our looking at objects through the eyes; sometimes to the appearance of colour located upon the object; sometimes to the unperceived cause or condition which gives rise to the sensation. The second of these applications appears the most natural and correct.

Compare.—To observe the resemblance, difference, or other relation between two objects of knowledge. The act or process of comparison is an important means of acquiring knowledge.

Conceive.—To bring before the mind the idea or image of some quality or object which has been previously directly known. Thus it is nearly synonymous with *imagine.*

Concept.—Literally that which has been conceived or imagined. But the word is generally used in a restricted sense to indicate the *conceived qualities* of a *class* of objects by which all the members of the class are characterised and distinguished from other classes.

Conceptualism.—The name of a doctrine according to which the *concept* of a class of objects is regarded as being *general* instead of the *name* of the class or the *class itself.*

Concomitant.—When several objects of knowledge or thought appear before the mind at the same time they are said to be *concomitant.*

Conscience.—The ability which we have to discern between the rightness and wrongness of actions.

Consciousness.—The immediate knowledge which the mind has of its own acts or operations is called *consciousness.*

Conscious-subject.—That which is conscious of the operations and objects of the mind in immediate knowledge is called the *conscious-subject, self* or *ego.*

Consequence.—The act or condition of following from something that has gone before. Used chiefly in logic.

Consequent.—When two objects of knowledge appear *in sequence*, the one following the other, that which follows is the consequent.

Contiguity.—A principle of association uniting two or more objects that have appeared before the mind, the bond of union being that they have been known *near to* one another either in time or place.

Correlation.—When two objects or series of objects are *mutually related* to one another they are said to be in *correlation*, and they are called *correlatives.*

Cosmology.—That branch of universal philosophy which treats of the formation and laws of the *cosmos* or *universe.*

Critical.—The name of a method of studying the phenomena of the mind which discriminates between some of these phenomena as being accidental and others which are characterised by necessity and universality. The process of thus discriminating is called *criticism.* The school of philosophy, founded by Kant, which makes prominent use of this method, is called the *critical school.*

Data.—Things that are given or assumed at the commencement of any course of study or argument.

Define.—To state the *essential qualities* of a class of objects, or the meaning of a *concept.*

Definition.—The result of the above process. It is to be distinguished from a *general description,* which deals with any qualities by which objects or classes are known.

Desire.—A feeling of want in the mind, leading us to seek after objects fitted to satisfy the want. The *desires* are distinguished from the *appetites* in being of a higher character, and not originating in a condition of the organism.

Development.—The process of unfolding what is contained in the germ of any organism. The seed of a tree or the young of an animal *developes* into maturity. The application of this process to the explanation of the production of all things in the universe is usually called the *development hypothesis.*

Difference.—One of the original relations perceived between objects, in virtue of which we affirm that they are, in some respects, *unlike* one another.

Differentia.—In classification, the qualities which distinguish one species from others belonging to the same genus are called *the differentiæ.*

Divide.—To separate a class of objects into subordinate classes. The process of *division* is the counterpart of *definition,* the former being occupied with the *members* of a class, the latter with its constituent *qualities.*

Dualism.—The doctrine that there are two different series of things, the one mental and the other material, is called *dualism.* This is either a psychological or an ontological doctrine. In the former case it refers to the dualism of *phenomena,* or objects of knowledge; in the latter case to the dualism of *existence* considered as apart from knowledge.

Ego.—The *I* or *conscious-subject* of knowledge.

Elaboration.—The process of comparing, combining, classifying, and drawing inferences from the primitive objects of knowledge. The power or ability to do these things is sometimes called the *elaborative faculty.*

Element.—Any of the simple qualities, parts, or characteristics of complex objects are called its *elements.*

Ether.—A hypothetical fluid, incapable of being perceived, invented to explain the phenomena of light and colour.

Ethics.—That department of philosophy which deals with conscience, and the laws of human conduct in relation to its rightness and wrongness.

Evolution.—Another term for *development.*

Expectation.—A form of imagination in which the object or event before the mind is *expected* to be realised or occur at some future time.

Experience.—The process of acquiring knowledge by direct, personal observation or study of the things to be known. It is a question amongst psychologists whether all our knowledge is derived from experience, or whether some elements of knowledge are the conditions of experience.

Experiment.—That process of pursuing knowledge which makes use of an artificial arrangement or combination of elements is called *experiment,* and the method is called *experimental.*

Extended.—An object is said to be *extended* when it occupies a certain portion of space.

Extension.—That quality of objects in virtue of which one part of them is recognised as being *without* the other. Extension is a *limited* portion of space.

External.—The condition of *being without.* The parts of an extended object are *external* to one another. All material objects are *external* in reference to the mind.

Faculty.—The power possessed by the mind of performing certain kinds of actions. The power of knowing is called the cognitive faculty; the power of determining to do anything, the faculty of volition, and so on.

Feelings.—The name applied to the second great class of mental phenomena, intermediate between the cognitions and voluntary efforts. The feelings are not elements of knowledge; they are incentives to action.

Force.—That which causes motion or change. It is known immediately as exerted by ourselves, and thence inferred as the cause of motion or change without us.

Form.—The conditions, or setting, or relations in which the objects of conscious knowledge are placed. All things that are known must be either *simultaneous* or *successive.* The former relation is the basis of the *form* of extension or space; the latter of that of time.

Formal.—In psychology, the elements of space, time, and other relations of objects are called *formal*. *Formal logic* studies the forms of thought.

Function.—The peculiar kind of action performed by any particular organ or faculty is called its *function*. It is the function of the leg to walk and of the eye to see.

General.—Any quality which is found in a large number of objects is called *general*. So is a name which is applied to a whole class. Anything found in, applied to, or belonging to all the members of a class is commonly called *general*.

Generalise.—To argue from a limited number of cases to a general law is to *generalise*; as, *e.g.*, when we conclude that because some bodies gravitate, therefore all bodies do so.

Generalisation.—The process of extending to all the members of a class what is found true of some.

Hypothesis.—An explanation of an event or condition of things whose cause is unknown is called an *hypothesis*. A *hypothetical* explanation is frequently made use of for the purpose of finding the true explanation. If the hypothesis is found to be correct it is then called a *theory*.

Idea.—A term used in psychology with a variety of meanings. It often means the revival of a sensation, or the representation of some mental object formerly presented. By the older psychologists external qualities of objects were supposed to be known by means of their ideas conveyed to the mind through the senses. This doctrine is no longer held, and *ideas* are generally used in the former sense.

Ideal.—Distinguished from *the actual* by being better and more perfect. Plato held that in the divine mind there were *ideals* of all earthly objects after which they have been created. The *ideal* is that perfect condition of excellence in art or life which we should attempt to *realise*.

Idealism.—The name of a system of philosophy which holds that we cannot know anything except ideas. If it is held that nothing *exists* except ideas and minds by which these ideas are perceived, it might be called *absolute idealism*. When the ideas known are held to be the representatives of unknown material objects or qualities we have *cosmothetic idealism*.

Identical.—When an object now known is found to be *exactly the same* as one previously known it is called *identical*.

Identity.—Sameness. Applied to the conscious-subject, which continues the same through every variety of mental phenomena, it is known as *personal identity*.

Imagination.—The power or act of recalling and holding before consciousness the mental objects already known. It is a power of very extensive operation, being exercised in perception, memory, expectation, science, art, ethics, and religion, and being frequently combined with other mental powers.

Immediate.—A term applied to direct knowledge, or the knowledge of objects by consciousness. That which is known in consciousness is *immediately* known. Sometimes, however, it is used in a logical sense to distinguish directly-acquired knowledge from that which is the result of a course of reasoning.

Impression.—An effect supposed to be produced upon the senses or the mind by the qualities of objects. This word was much used by the older English psychologists, but is now almost or entirely obsolete in its psychological use.

Individual.—An organised body which cannot be divided or broken up without destroying it is called an *individual.*

Induction.—The process of reasoning from a number of particular cases to a general truth or principle. A system of philosophy which largely or exclusively adopts this method is called *inductive.*

Infer.—To draw a conclusion from something which we now know to the existence of some object or relation not already known.

Innate.—Some condition in the constitution of the mind not acquired by experience but *inherited.* Used chiefly by the older psychologists, and applied incorrectly to *ideas.*

Integration.—The act of constructing in the mind a unity of objects. It is the highest law of association.

Intellectual.—A name applied to the mental powers engaged in *cognition.*

Interference.—A doctrine of some older psychologists who held that matter and mind are two distinct and separate forms of existence without a natural means of communication, and that knowledge is brought about by divine *interference.*

Intuition.—The knowledge which we have in consciousness of the primary relations of objects. Applied by some writers to the self-evident and necessary axioms or laws of thought.

Judge.—To assert the existence of any relation between objects of knowledge. Synonymous with to *predicate.*

Know.—A term used in two senses, a narrower and a wider. In the narrower sense it is applied to conscious knowledge; in the wider sense it comprehends the results of the elaboration of knowledge as well, and thus may be applied to any of the contents of *science.*

Knowable.—Things which may be known directly or by the employment of recognised scientific methods, or by legitimate inference from what is known, are *knowable.*

Latent.—A term applied in psychology to alleged mental activities going on beneath the sphere of consciousness. *Subconscious mental activity.*

Light.—(1) The sensible phenomenon which we see by means of the eyes. (2) That which, coming into contact with the retina of the eye, gives rise to light or colour as seen.

Localise.—In psychology, when we learn what group of sensations or possible sensations are invariably connected with some particular one, we are said to localise it.

Logic.—That department of philosophy in which we study the laws and forms of *thought.*

Matter.—A term applied first to the sensible objects of the world, and secondly, to the inferred *substratum* or *substance* underlying the sensible qualities.

Mediate.—Knowledge which is not acquired by direct observation in consciousness but through the *medium* of some process of reasoning is *mediate.*

Memory.—A form of representative knowledge in which we *recognise* the object remembered as having been previously known.

Metaphysics.—That department of philosophy which is concerned with the ultimate or necessary principles of intelligence, and with real as distinguished from phenomenal existence.

Method.—The order of procedure in seeking for a solution of the problems of philosophy. For example, the inductive, or the analytic method.

Mind.—That part of our complex nature which perceives, thinks, feels, wills, and performs other such operations is the mind.

Moral.—Pertaining to right conduct.

Name.—A word which is applied to an object or class for the purpose of distinguishing it from others is its name.

Necessary.—A quality attaching to certain kinds of truth. There are some things which not only *are* so and so, but *must be* so and so. Material objects *must be* extended. Every change *must* have a cause. Truths such as these are characterised by *necessity.*

Nominalism.—A doctrine connected with classification, according to which the *name* of a class is *general* instead of the *class* itself. See *Conceptualism.*

Non-ego.—A name applied generally to all objects which come into the relation of knowledge with the ego. The non-ego may be mental as well as material.

Noumenon.—That which cannot be known directly in consciousness, but is conceived or inferred by the mind to account for the existence and character of phenomena.

Object. —Anything that is known by the conscious-subject is called an *object*. The object may be a mental condition, a sensation, a condition of the organism, or a group of sensible qualities—anything, in short, which can be set over against the subject in the relation of knowledge.

Objective.—Pertaining to an object; the correlative of *subjective*.

Objectification.—The act of converting a mental state into an object of consciousness by turning attention to it.

Odour.—That which affects the sense of smell.

Ontology.—The department of philosophy which is concerned with *real* as distinguished from *phenomenal* existence.

Opposition.—A doctrine of logic concerning the relations of propositions having the same terms, but differing in quantity, quality, or both.

Organism.—A name applied to the body considered as composed of a variety of *organs* all together forming a living system.

Particular.—A word used to designate one or a few members of a class, as distinguished from *general* and *universal*.

Passion.—A very powerful appetite, desire, or emotion.

Perceive.—To know objects beyond the sphere of simple consciousness. That which is perceived may be called a *percept*.

Perception.—The complex and acquired process by which we know extra-mental and distant objects.

Person.—Applied in philosophy to an individual man considered as being one and the same during succeeding periods of time.

Personality.—The condition of being a person. That which constitutes an individual one and the same notwithstanding many successive changes.

Personify.—To attribute *personal* characteristics to inanimate things.

Phantasm.—An image or representation appearing in consciousness. The power of producing phantasms in the mind is called *phantasy*.

Phenomenon.—An appearance. Anything which appears in consciousness, and thus is an object of knowledge, is a *phenomenon*. The correlative of *noumenon*.

Philosophy.—Literally, the pursuit of wisdom. A term applied very widely to a variety of subjects of study, but properly applicable to the study of the mind.

Power.—Synonymous with *force* as applied to physical power, but often applied to mental abilities also.

Predicate.—To affirm some relation to exist between two or more objects of knowledge. The act of doing so as well as the verbal expression of the act is a *predication.*

Prescind.—To separate some quality of an object for the purpose of studying it.

Presentation.—A name applied to objects or qualities brought directly before consciousness. This direct knowledge is called *presentative.*

Projection.—The process of transferring sensations to a distance outside of the organism, the ability to do which is acquired during the unconscious period of infancy. A very important element of perception.

Psychology.—That department of philosophy which studies mental *phenomena.*

Psychological.—Pertaining to psychology. It is, however, used by some writers to designate a particular method of studying psychological problems.

Psychogenetical.—That method of studying psychological problems which accounts for certain mental conditions now existing by postulating a long process of mental development during past generations.

Quality.—A sensation projected beyond the organism and united with a group of other projected sensations is known as a *quality.* Colour, hardness, softness, odour, &c., are qualities. Anything pertaining to quality is *qualitative.*

Quantity.—A term applied to the relations or *form* of qualities, as their extension, figure, motion, continuance, and so on. Anything pertaining to quantity is *quantitative.*

Real.—A term applied first to anything which has an *objective* as distinguished from a *mental* or *ideal* existence; and secondly, to *noumenal* as distinguished from *phenomenal* existence.

Realise.—To convert an object thought of or imagined that is an *ideal* object into an *actual* object.

Realism.—A philosophical doctrine opposed generally to idealism. It affirms that there exists a real, material world known either directly or mediately. In the former case it has been called *natural,* in the latter *hypothetical realism.*

Recognise.—To perceive *the sameness* of an object now known to one known previously. *Recognition* is the most important element of *memory.*

Redintegration.—A law of association according to which the mind seeks to complete the sphere of a past and partially forgotten knowledge.

Reflect.—To turn the attention of the mind backwards upon its own operations. *Reflection* is almost synonymous with *consciousness.*

Relation.—"Any sort of connection which is perceived or imagined between two or more things, or any comparison which is made by the mind, is a *relation.*"

Relative.—Two or more things thus existing in any kind of mutual connection are *relative* to one another, and may be called *relatives* or *correlatives.*

Relativity.—The condition of being relative.

Relativity of Knowledge.—The doctrine that in knowledge the conscious-subject must be brought into relation with the object known, and *vice versâ.* This is an absolutely essential condition of true knowledge.

Represent.—To bring again before consciousness something formerly *presented.*

Representation.—That which is thus represented is called a *representation, idea,* or *image.*

Representationism.—A doctrine of perception according to which external objects are known by means of intermediate and *representative* ideas or images.

Resemblance.—One of the primary relations existing between objects by virtue of perceiving which we are able to affirm that they are more or less nearly *like* one another.

Revival.—When a past mental act or object, once forgotten, is again brought into consciousness it is called a *revival* or *representation.*

Sapidity.—The quality of objects perceived by *taste.*

Sceptical.—A name of a philosophical system which either proceeds by the method of *doubt* as in Descartes, or terminates in *doubt* as in Hume. Scepticism as a *method* is legitimate; as an *end* it is disastrous and suicidal.

Science.—The demonstrated and systematically arranged knowledge of *phenomena* is properly called *science.* Sometimes the term is applied, beyond its legitimate sphere, to the doctrines of metaphysics or theology dealing with *non-phenomenal* objects.

Self.—A term synonymous with *ego* or *conscious-subject.*

Sensation.—One of the original elements of knowledge, being a *feeling* in consciousness arising from some affection of the organism.

Sensationalism.—The philosophical doctrine which derives all the elements of our matured knowledge from simple sensations.

Senses.—The organic means of communication between the mind and the external world.

Sensorium.—The organism considered as being the sphere of the operation of the senses is called the *sensorium.*

Sequence.—The relation existing between objects which *follow* one another.

Sight.—The power of perceiving light or colour.

Simultaneity.—One of the primary relations of mental objects consisting in their being before consciousness *at the same time.*

Sound.—That quality which is *heard* by the ears.

Space.—The *form* in which all material objects are perceived by the mind. The *whole of extension* is space.

Speculative.—A term sometimes, but incorrectly, applied to philosophy to distinguish it from *scientific.* As a matter of fact, science, in the hands of its leading exponents, is quite as speculative as philosophy.

Subject.—That which knows and is conscious. Synonymous with *self* or *ego.*

Subjective.—Pertaining to the subject of the mental phenomena. Correlative of *objective.*

Substance.—That which was inferred by the older philosophers to underlie the qualities of material objects; otherwise called the *substratum.*

Succession.—One of the primary relations of objects of knowledge in virtue of which we affirm that they *come after* one another in time.

Synthesis.—The process of *constructing* the objects of knowledge from their simple elements. The correlative of *analysis.* The *synthetic* method adopts synthesis principally in building up a philosophy.

System.—The orderly arrangement of elements, whether subjective or objective, for a certain end is called a system.

Tactile.—The quality of bodies *felt* in touch.

Term.—Literally a boundary. Objects brought together in *a relation* are called its terms; so also are *words* joined together in a *predication* or *proposition.*

Temporal.—Pertaining to time.

Theology.—The doctrine concerning God and His relations to the universe, spiritual and physical.

Theory.—An established explanation of any phenomena. Distinguished from *hypothesis,* which is an explanation proposed for examination and trial as a means of reaching the true theory.

Think.—To study objects and their relations, with a view of reaching a knowledge of causes and principles, and forming a system of truth. *Thought* is the product of *thinking*.

Time.—The *form* in which all objects, mental and material, are known. An abstract derived from the study of phenomena *as succeeding* one another.

Ultimate.—That which is reached as the *last result* of a process of investigation.

Unity.—The condition of *oneness* or *completeness*. The grand aim of the mind in the pursuit of knowledge is unity.

Universal.—That which is found in, or true of, all the members of a class is *universal*. What is true of all objects of actual or possible knowledge is universal by pre-eminence.

Unknowable.—That which cannot be brought within the relation of knowledge to the mind. Some would put into the sphere of the *unknowable* everything which cannot be *directly* known by some human mind, as in consciousness or perception. Others consider to be *knowable* anything which may be legitimately *inferred* from things directly known.

Volition.—The act of *the will* in determining to do anything. The doing of the action thus willed may be called a *voluntary activity*.

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